

INFO WORLD

The Voice of Client/Server in the Enterprise



Livingston looks ahead: Rich Baby Gates and \$100 wrist PCs appear in Brian's off-beat crystal ball. 35

CD-ROM server software compared	
	Price
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Softlet CD-Manager 3.01	5.9 \$895
LandCD 3.2	5.7 \$1,395
SCI Express 2.5 for NetWare	5.0 \$895

Disc jockey deluxe: CD-Now keeps your CD-ROMs on track, but its price may make your heart skip. 66

Web integration spreads

Sun will add IPX gateway to Internet servers

■ Novell at work on embedding Java applets in NetWare Directory Services

By Paul Krill

IS MANAGERS struggling to integrate NetWare with the Internet can look forward to some relief thanks to separate initiatives by Sun Microsystems Inc. and Novell Inc.

Sun's SunSoft unit plans to release in April a version of its WebScout Internet application suite that in-

cludes an IP/IPX gateway. This gateway will enable NetWare IPX clients to access IP services on the most widely used Internet server platform without having to install both IPX and TCP/IP protocols on the desktop.

On a more ambitious scale, Novell has begun working on a project

to add support for applets written in Sun's Java programming language to its NetWare Directory Services (NDS).

Due next year, the ability to store Java applets in NDS would enable applets to be launched via any client linked to the directory, said Mark

► **NETWARE** page 20

SPECIAL NEWS REPORT

Network OLE is the key to Microsoft's component plan



Enterprise OLE gets under way

By Mike McQuinn

A year's worth of being enabled as simply an overgrown purveyor of desktop applications, Microsoft Corp. is gearing up to make

its most ambitious assault ever to win over corporate IS managers with the delivery this spring and summer of the first components in its Enterprise OLE architecture. The linchpin of this strategy is Network OLE, a set of system services scheduled to

► **OLE** page 12

Arrival of Microsoft's server spurs PC vendors into action

■ Systems bundled with IIS will debut this week

By Deborah DeVoe

LOOKING TO CASH in on demand for low-cost World Wide Web servers, PC vendors are hopping on the Windows NT bandwagon with systems powered by Pentium and Pentium Pro processors from Intel Corp.

Thirteen PC server manufactur-

ers are lining up behind Microsoft Corp. this week to show support for Internet Information Server (IIS) software, with Zenith Data Systems Corp., Dell Computer Corp., Intergraph Computer Systems Inc., and Hewlett-Packard Co. leading the pack.

► **SERVERS** page 20

Sun standard creates tight Java-SQL link

■ JDBC designed to bypass need for CGI

By Martin LeMonica

TO ADD FUEL to its campaign to position Java as a mainstream language for building client/server applications, Sun Microsystems Inc. later this month will unveil a specification designed to let Java applications directly access back-end databases, the company confirmed last week.

The specification, called Java Database Connectivity (JDBC), will be published on Sun's World Wide Web site for public comment and finalized within a few months, said Jeff Siegel, group manager for business development at Sun's JavaSoft division.

Some relational and object database vendors, including Borland International Inc. and Object Design Inc., as well as suppliers of database drivers such as Interbase

► **JDBC** page 20

ENTERPRISE: REMOTE-ACCESS REALITY

No longer an oddity or a luxury, remote access has become an integral part of the enterprise. Although the case for remote has grown stronger, remnants of the flaws that once discouraged it remain. Costs can still be prohibitive, management can still be difficult, and security can still be a problem.

That's why you need a solid strategy if you expect to be remotely successful. See page 61.



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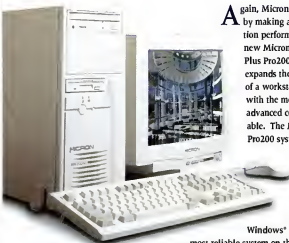
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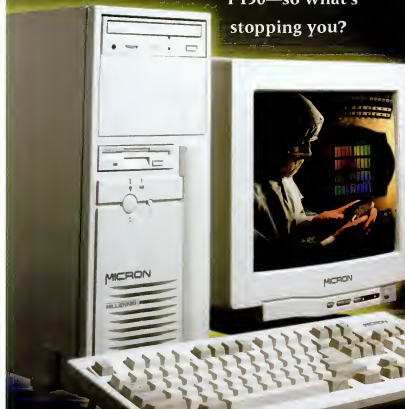
—PC Magazine, April 25, 1995

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OpenDoc on ROM may be in works

■ Development environment would work with Java applets

By Tom Quinlan

IN AN EFFORT to boost the network performance of OpenDoc applications, Apple Computer Inc. and IBM are exploring embedding the object-based development environment onto a ROM chip.

This ROM version of OpenDoc would increase application speed and decrease the amount of memory needed to run OpenDoc applets, sources said.

Users would be able to create compound documents using OpenDoc in conjunction with Java applets downloaded over the Internet, without having to worry about performance or memory limitations.

Companies would also benefit from OpenDoc embedded in ROM on servers, because they would be able to track and create documents over a standard LAN or the Internet at much faster speeds, sources said.

By placing the source code in ROM, OpenDoc — which currently requires about 2MB of memory when loaded as part of the OS — could also be used in much smaller

devices, such as hand-held Internet terminals or set-top boxes.

"If you put it in ROM, then it really doesn't matter if [OpenDoc] requires 2MB or 3MB of memory to run efficiently," said one source.

IBM and Apple would use the ROM chips in their own portables, sources said, and license the technology to other developers. The ROM chips would likely not appear until OpenDoc 2.0 for the Macintosh and OS/2 ships in late summer.

A communications link between the OpenDoc ROM and the OS would also be added, sources said, so that as OpenDoc components were upgraded, users could run the latest versions of the software from the OS as needed.

Apple and IBM declined to comment on specific plans for embedding OpenDoc on a ROM chip, but Anthony Brown, IBM's manager of object management technology marketing, said IBM was considering moving OpenDoc to the processor level.

"We see a lot of benefit from

doing something like that," Brown said. "That's something we can probably talk about in a few weeks. Our main focus would be to provide a better OpenDoc environment for portables and servers for mainstream business customers."

Tentative plans to put OpenDoc into ROM follow Sun Microsystems Inc.'s announcement — and subsequent statements by Motorola — about the development of processors designed specifically for environments like Java applets, (F, page 1.)

Although neither company has briefed its development community on the ROM chip, most developers consider the chip a good idea.

"It does have a fairly large footprint right now," said David Smith, in charge of OpenDoc development for Virtus Corp. "Putting it in ROM would certainly make it more suitable for portable systems and even smaller devices, where they think OpenDoc has very strong potential."

Packard Bell buys Zenith, gains corporate customers

By Deborah DeVoe

A CORPORATE PRESENCE will be part of the stronger Packard Bell Electronics Inc. that is expected to emerge next month when the company finalizes its purchase of Zenith Data Systems Corp.

The consumer PC giant will gain access to the corporate marketplace through last week's acquisition of Zenith's notebook and server lines along with Zenith's brand-name recognition.

"There's a lot of synergies between the companies," said Mal Ransom, vice president of marketing at Sacramento, Calif.-based Packard Bell. "Packard Bell is strong in the retail channels, while Zenith is well established in the commercial, government, and education markets. Packard Bell's manufacturing efficiency and fast-to-market strategy have been successful in retail and should bring success to the commercial market."

But Packard Bell will still have to leap a number of hurdles before claiming success, analysts said.

"When Bell [Groupe Bell, Zenith's parent company] took over Zenith, it certainly wasn't a re-

sounding success. Just because Packard Bell is taking them over now doesn't ensure their success," said Wayne Kernochan, director of commercial systems research at Aberdeen Group Inc., in Boston.

"The corporate market may have higher margins, but it's more difficult to gain market share. Companies have the habit of dealing with [regular] suppliers, and though Zenith certainly delivers an installed base, it has little visibility,"

Kernochan added.

Such an expansion into corporations will be costly, analysts said.

"We believe in the short term that there's not the financial depth at Packard Bell to leverage the Zenith brand," said John Dunkle, president of Portsmouth, N.H.-based Workgroup Strategic Services Inc. "We think you'll see very steady approaches, starting with near-term expansion into notebooks, reducing price and bringing them into the Packard Bell channels. Then in six to eight months we expect to see Packard Bell pushing a server for the small business environment."

As part of the \$650 million agreement, Packard Bell not only will acquire Zenith from Groupe Bull, but also will receive \$283 million in cash from Tokyo-based NEC Corp., providing Packard Bell with needed funds for leveraging the company's expanded resources, Packard Bell officials said.

Both Groupe Bull and NEC are 19.9 percent shareholders in Packard Bell; each will receive redeemable nonvoting preferred stock in return for their investments, officials said.

A tale of two companies

PACKARD BELL ELECTRONICS INC.

Unit sales	3 million
Systems	486, Pentium
OSes	Windows 3.x, Windows 95
Markets	Consumer
Outlets	Retail, mass merchandise, warehouse stores

ZENITH DATA SYSTEMS INC.

Unit sales	600,000
Systems	Pentium, Pentium Pro, PowerPC
OSes	Windows 3.x, Windows NT, Unix
Markets	Business, government, education
Outlets	Distributors, computer specialty stores

COGNOS SET TO UNVEIL POWERPLAY, VERSION 5.0

AT DEADLINE

Cognos Corp. next week will introduce a 32-bit Windows and Unix upgrade to its PowerPlay on-line analytical processing tool geared at handling large volumes of data warehouse data. PowerPlay, Version 5.0, can store multidimensional data in relational databases and can be accessed by tools that support OLE 2.0, such as Microsoft Corp.'s Visual Basic. A new API will allow programmers to tie the PowerPlay tool to other applications as well. PowerPlay Client, priced at \$695 per user, can handle as many as 2 million records and works with Arbor Software Corp.'s EssBase, Oracle Corp.'s Express, and Pilot Software Inc.'s LightShip. PowerPlay 5.0 is slated to ship in June.

SYBASE READIES WEB AUTHORIZING TOOL

Sybase Inc. later this month will announce a multimedia authoring tool for the World Wide Web called Media Splash, as well as a companion run-time video and graphics player, according to company officials. The player, called Splash PC, is a Web applet designed to let a PC user download material without requiring data compression technology or a high-bandwidth transmission line, officials said. Both products are derivatives of Sybase's Gain Momentum authoring tool.

3COM SHIPS VLAN MONITORING CARD

3Com Corp. will ship this week a network card that simplifies virtual LAN (VLAN) monitoring on Ethernet networks. The OnCore Advanced Ethernet Network Monitor Card (Advanced NMC) is designed for enterprise backbone networks and Ethernet segments. It provides full support for remote monitoring (RMon) and for the emerging RMon2 standard. The Advanced NMC card is priced at \$2,995. In a related announcement, 3Com officials said the company has completed Phase 1 of a three-phase strategy to integrate its ONdemand NCS network management application with its Transcend network architecture.

IBM TO INTEGRATE ANYNET, SNA GATEWAY

IBM during the next several months plans to integrate its AnyNet multiprotocol software into its Communications Manager SNA gateway, the company said. AnyNet allows Sockets applications to flow over Systems Network Architecture (SNA) or TCP/IP networks.

BRIEFLY NOTED: ■ **HEWLETT-PACKARD CO.** and **CISCO SYSTEMS INC.** will announce next week an expansion of their existing product development agreement. The companies will ship this fall an integrated router module for HP's AdvanceStack boxes, and Cisco will develop and ship 100VG-AnyLAN interfaces for some of its routing platforms this year and next year. Cisco will roll out the first 100VG interfaces for its 7500 series of routers about midyear.

■ **MICROSOFT CORP.** plans to ship Release Candidate 2 (RC2) of Exchange Server on Feb. 15. RC2 includes the patches to RC1 that add automatic Uniform Resource Locator recognition and other Internet functionality. The ship date for RC2 makes a first-quarter ship date for Exchange unlikely. Observers expect Microsoft to commercially release the product at the Electronic Messaging Association event in late April. ■ **CROSSSCON CORP.** last week appointed long-time IBM official William "B" Johnson as its president and CEO. Johnson replaces Tad Witkowski, who will become chairman of the board. ■ **CISCO AND STARBURST COMMUNICATIONS CORP.** will announce this week a joint project to expand the scalability of Starburst's multicasting File Transfer Protocol software. The project will extend multicast file transfer to the wide area via Cisco routing systems. The companies said they expect to deliver the first products in the collaboration within six to 12 months.

NEWS

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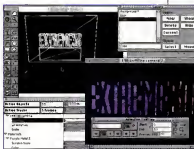
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Macromedia's Extreme 3D bridges PC and Mac platforms, [page 28](#)



PRODUCT COMPARISON

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Bob Metcalfe takes a look at MultiCruise, an NT network system that uses clipboard-size clients, [page 56](#)

Product comparison: CD-ROM server software, [page 66](#)



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Unix vendors focus on 64-bit future at UniForum '96

By Jason Pontin

FOR THE UNIX WORLD, it's 64 bits or bust.

At UniForum '96 this week in San Francisco, the biggest names in Unix will give users a glimpse of their 64-bit plans, and a new standards organization will unveil the first draft of a common 64-bit API for Unix developers.

The move from 32 bits to 64 bits is meant to keep Unix in the hearts and minds of users as the high-end platform for database servers, engineering, and graphics, according to analysts.

"It's not going to be as quick as moving from 16 [bits] to 32 bits on the desktop," said Rob Enderle, an analyst at Giga Information Group, in San Jose, Calif. "But as the performance advantages of 64 bits for very large database applications and for multimedia, CAD/CAM, and 3-D become clear, 64 bits will come to seem very compelling for Unix's traditional users."

At UniForum, vendors will introduce new versions of their operating systems that contain 64-bit parts and will outline their road maps for migrating to 64 bits.

The following are among the results planned:

- Hewlett-Packard Co. will announce the release of an HP-UX upgrade that includes support for the very large data files associated with 64 bits. (See related story, page 38.)
- At the same time, HP will mount the podium with The Santa Cruz Operation Inc. to inform conference attendees about a joint development effort to release 64-bit versions of HP-UX and SCO OpenServer/UnixWare sometime in 1998, according to Scott McGregor, SCO's senior vice president.
- SCO also will put UnixWare on

the road to 64-bitness when it announces at UniForum the release of SCO UnixWare 2.1, which supports very large data files much like HP-UX 10.10, McGregor said. UnixWare 2.1 will also include Novell Inc.'s NetWare 4.x network services.

■ Sun Microsystems Inc. will describe a phased implementation that will gradually add 64-bit features to Sun Solaris, according to David Spenhoff, director of Solaris product marketing.

Solaris 2.5 already supports the 64-bit UltraSparc chip and 64-bit arithmetic processing, according to Spenhoff. In mid-1996, Sun will add 64-bit asynchronous I/O in order to support upcoming database applications, such as Oracle Corp.'s Universal Database and Informix Software's Inx Universal Server.

Early next year, according to Spenhoff, Sun will begin to support 64-bit files as large as a single terabyte in size. And in early 1998, Solaris will become fully 64 bit when Sun adds a 64-bit kernel and a new file system that can support a library as large as 9 million terabytes — or 2 gigabytes for every person on the planet, Spenhoff said.

Also at UniForum, X/Open Co. Ltd., in Reading, England, and the Open Software Foundation, in Cambridge, Mass., will announce that they have merged to form Open Group, the organization that will be responsible for creating a common set of standards for the new platforms.

Specifically, Open Group will try to build on the early success of the Unix 95 standard and create a single API that all Unix developers can write to, regardless of their target platform. Unix vendors and Open Group are expected to unveil a first draft of the new API at UniForum.

Posix-compliant systems

NT to adopt Unix personality

By Jason Pontin

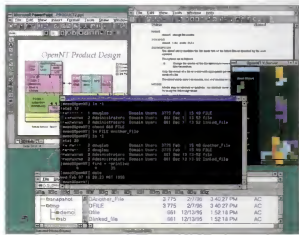
MICROSOFT CORP. and Software Systems Inc. will announce this week at UniForum '96 a Unix personality that fits on top of the Windows NT kernel so that users can run both Unix and Win32 applications in native mode.

San Francisco-based Software licensed the NT source code to build its OpenNT Commands and Utilities, a Posix-compliant Unix environment that Microsoft and Software hope will let NT compete for government contracts that require Posix compliance.

Software said OpenNT will run on all NT-Intel Corp. platforms with only 16MB of RAM.

Running Unix and Windows binaries on the same platform is the best way to make Unix and Windows applications coexist on the same system, according to Dan Kuznetsky, the director of Unix systems research at International Data Corp., in Framingham, Mass.

"Potentially, OpenNT is a much better solution than running Windows apps under emulation or tying Unix desktops to a Windows NT server," Kuznetsky said. "This could be quite a bit faster."



OPENNT LETS USERS run Unix and Win32 applications in native mode on a Windows NT system.

OpenNT will be released in two stages. The first version, priced at \$199, will ship in late March. It will provide a full set of utilities and a command shell conforming to the IEEE Posix 2 Execution Environment — the standard required by many government contracts.

A second version, due later this year, will also comply with the XPG4 specifications that the

X/Open consortium laid down last March for future versions of Unix.

Unix applications written to the Posix and XPG4 specifications will be able to move to OpenNT with only a simple recompile, according to Software.

Other Unix applications can be ported using a \$99 OpenNT software developer's kit that is set to ship in October.

Netscape to offer new Web design tool

By Nick Wingfield and Michael Parsons

HOPING TO MAKE an end run around Microsoft Corp.'s Internet Studio World Web development tool, formerly known as Blackbird, Netscape Communications Corp. last week launched a migration program to woo Internet Studio developers to Netscape's tools.

Through its Netscape Developer's Program, the company will offer Internet Studio developers beta versions of the Netscape Navigator

Gold Hypertext Markup Language (HTML) design tool, Netscape Communications Server, and LiveWire Pro web site management software, including full-development licenses.

Netscape is also collaborating with Macromedia Inc. to provide developers with a discounted version of Macromedia Director, which can be used to create interactive applets for Netscape Navigator 2.0.

Developers will also receive a version of FutureTense Inc.'s Tex-

ture, a Java applet for advanced layout of Web pages.

Netscape's program follows the admission by Microsoft last week that it is abandoning development of Internet Studio for Microsoft Network in favor of an Internet-only version.

Internet Studio will include HTML-authoring capabilities and the capability to integrate OLE custom controls. Microsoft is not yet discussing pricing or availability.

Although Web developers welcomed Microsoft's change of strategy, many are already investing their efforts in Java and Director.

"Internet Studio is very seductive," said Greg Johnson, chief technology officer at Magnet Interactive Group, in Washington. "But until we have it in our dirty little hands, we'll reserve judgment. Applets and executables over the Web are strategic, and Java is the most viable option."

Netscape Developer's Program costs \$495 per year.

Michael Parsons is a correspondent with the D.C. News Service in San Mateo, Calif.

going down dramatically, and we're much more communicative with our salespeople."

SBT also announced that WebStreet, its internally developed mall of more than 500 Internet businesses, will be ported to Microsoft's Internet Information Server, which sports built-in encryption and database links under Windows NT.

WebTrader SQL is due to ship in the second quarter for \$2,995.

Nick Wingfield contributed to this report.

WebTrader to use server with update features

By Chris Jones and Paul Krill

THE NEXT VERSION of SBT Internet Systems Inc.'s WebTrader business storefront software, called WebTrader SQL, will use Microsoft Corp.'s Internet Information Server to create World Wide Web links to databases that dynamically update inventories and other data.

Used in conjunction with Microsoft's Internet Database Connector,

which comes with Internet Information Server, WebTrader SQL enables users to dynamically access SQL Server databases and other Open Database Connectivity-compatible databases.

Companies using the previous version of WebTrader to post order forms on the Web and to receive orders via E-mail. With the new version, customers and sales staff will

be able to access and interact with home pages dynamically linked to current database information, such as inventory levels or pricing.

"WebTrader SQL is going to be so important to our business that we can't afford not to buy it," said Bob Kuzura, a marketing representative for Kaleidoscope Designs, in Sausalito, Calif. "It has eliminated a lot of paper handling, our costs are



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IBM OS/2 Warp release generates enthusiasm

■ Users praise features in 32-bit package

By Paul Krill

AFTER TWO YEARS of development, IBM on Feb. 26 will ship OS/2 Warp Server, a 32-bit offering that may re-energize IBM's presence in the PC server market.

Beta versions of Warp Server, which merge LAN Server 4.0 with OS/2 in a single package, have been applauded by users for ease of installation and for the inclusion of utilities normally sold separately on rival systems, such as Microsoft Corp.'s Windows NT, Novell Inc.'s

File Synchron— which resynchronizes files from a mobile OS/2 Warp client back to the server upon reconnection — and AskPSF, an on-line technical help tool.

IBM is also considering the eventual integration of its Internet server software with the OS, said a company representative. This move would follow similar initiatives by Microsoft, The Santa Cruz Operation Inc., and Caldera Inc. (See story, page 33).

To counter Microsoft, OS/2 Warp Server will be priced competitively with NT, which doesn't include as many services in the base operating system, an IBM representative said.

Prices for OS/2 Warp Server 3.51 range from \$699 for a server with no client licenses to \$13,199 for a server and 500 clients.

"NT still has mind share, and it's up to IBM to execute a really good marketing plan," said Bob Sakakeeny, an analyst with the Aberdeen Group Inc., a market research company based in Boston.

Vendors such as Sybase Inc., Oracle Corp., and Brivie Technologies Inc. have pledged to support OS/2 Warp Internet Integration Server this year.

Still to be sold separately from OS/2 Warp Server is a Directory and Security Services module due by mid-1996.

This module will provide multiplatform OS/2 Distributed Computing Environment directory services similar to the services provided by NetWare Directory Services on NT. (See review, page 93.)

OS/2 Warp features

- LAN Distance Remote: remote-node support
- Distributed Console Access: Facility: remote systems management
- SystemView systems management
- Networking Solutions: backup and recovery tools
- Bi-directional printing support
- Internet Access Kit and WebExplorer
- Dynamic Host Configuration Protocol and Dynamic Domain Name System support
- Mobile File Synchron: remote file synchronization
- AskPSF: on-line technical support

NetWare, and a variety of Unix offerings. (See "Beta users like Warp Server, doubt its future," Feb. 22, page 31.)

"I'm really excited about [Warp Server] because it works," said beta user Bill Hovey, senior systems consultant at Avco Financial Services, in Irvine, Calif.

Utilities bundled with the package include LAN Distance Remote, Distributed Console Access Facility for remote systems management, and SystemView systems management tools.

Two newly added utilities in the final OS/2 Warp release are Mobile

Server software

Project Eagle takes flight

By Ed Scamell

AS AN ENCORE to the delivery of its OS/2 Warp Server, IBM plans to ship next month its seven long-awaited server application bundles for the OS/2 and AIX operating systems.

IBM will also ship three server bundles for Microsoft Corp.'s Windows NT in April with the remaining four scheduled for shipping later in the second quarter, said Bill Reedy, vice president of IBM's Integrated Solutions group.

Previously known as Project Eagle, the bundles are now called the IBM Software Servers; IBM has yet to pick a final name. No matter what they are ultimately christened, the application bundles will compete against Microsoft's BackOffice suite of server applications.

The seven bundles consist of applications, tools, and interfaces. They stack up the same for all three

operating systems: transaction processing, database, communications, the Internet, a Lotus Notes 4.0 server and tools, a SystemView-based server and tools for software management, and a Distributed Computing Environment-compliant server for directory services and security.

IBM had initially hoped to deliver the bundles last fall, but officials said last week the company was delayed by the effort of determining the right combinations.

The bundles will be pitched as-is to small and medium-size companies. For larger accounts, IBM plans to let users mix and match products and services across bundles.

"The premise there is that IT professionals will build specific solutions for end-users using these seven servers in whatever mix they need them," Reedy said.

IBM enhances PC 700 line

By Ed Scamell

IBM WILL REFRESH its high-end PC 700 Series of desktop systems later this month with two 166-MHz Pentium-based models that have a built-in feature for turning the systems on and off remotely.

Both the PC 730 and 750 contain "Wake on LAN," a combination of hardware and software that allows the machines to be activated over the LAN. It also enables IS support staff to perform software upgrades and a variety of routine maintenance tasks during off-hours. "If this really works well from

both the server and desktop ends, it would be a tremendous time-saver for corporate accounts with a lot of remote offices. Most of our employees turn their machines off before

IBM drops prices on PC 700 Series

Pentium	RAM	Storage	New price	Old price
75-MHz	8MB	540MB	\$1,339	\$1,409
100-MHz	8MB	540MB	\$1,669	\$1,852
133-MHz	16MB	1.2GB	\$2,499	\$3,002
166-MHz	16MB	1.2GB	\$3,019	\$3,447

they go home, and there is no efficient way of doing upgrades remotely when no one is there," said John Osborne, IS support specialist for a large automaker in Detroit.

In addition to the 166-MHz Pentium chip, standard features of the systems include 16MB of RAM, a choice of 1.2-, 1.6-, or 2-gigabyte (GB) hard drives, a PCI bus, and a 64-bit graphics board that complies with the MPEG video standard.

Users can order both systems with either IBM's Select A System software — which makes it possible for users to flip back and forth between IBM's OS/2 Warp and Microsoft Corp.'s Windows 3.11 — or Windows 95.

IBM will also bundle Lotus Development Corp.'s SmartSuite 96 and IBM's latest client version of NetFinity with the systems.

The server version will be bundled with IBM's upcoming 133-MHz Pentium-based servers. (See story, page 37.)

HP ENDORSES IBM PSM FOR PRINTER MANAGEMENT

By Judy DeMocker

IBM GAINED SUPPORT for its enterprise-wide printer management technology last week when Hewlett-Packard Co. came on board to license the technology underlying IBM's Printing Systems Manager (PSM).

Later this year, HP will offer its own version of PSM that will closely follow IBM's version, offering users a way to manage printing tasks and monitor printer status, HP officials said. Initially the software-based technology will be offered as an add-on package; later it will be integrated into the OS.

The object-oriented PSM technology is designed to tackle the hassles inherent in a Unix-based system, such as lost or misplaced jobs that lead to system bottlenecks, control when content-sensitive information is printed, and efficiency in routing jobs to the printers best equipped to handle them. IBM shipped PSM last September.

Even with HP's support, IBM will have to fight to make PSM a standard. A consortium composed of Digital Equipment Corp., Xerox Corp., and Sun Microsystems Inc. is developing a competing technology known as Printexchange, scheduled to ship later this year.

Both technologies grew out of the Massachusetts Institute of Technology's Project Athena, which hammered out the basis for the ISO's Demand Protocol Architecture standard. Printexchange is based on the Open Network Computing standard; PSM uses the Distributed Computing Environment.

Either technology would be welcomed by users, analysts said.

"As the number of printers attached via networks grows larger, users need products like PSM," said Susan Hayes, analyst with International Data Corp., in Framingham, Mass. "Users win when all the players adopt an industry standard that fosters interoperability between environments."

For the record

Contrary to the Jan. 29 story "Mobile computing tools set to improve" (page 12), Extended Systems Inc.'s JetEye Net Plus does connect directly to the network and not to the serial port of a host PC.

AST revamps Bravos with Triton, faster Pentiums

By Deborah DeVoe

IN LINE with its quick-to-market strategy, AST Research Inc. will announce this week support for Intel Corp.'s 430HX PCI chip set.

AST will deliver upgraded Bravo MS desktops in April using the chip set and the fastest Pentium processors, said Laura Raybin, director of product marketing for commercial desktops.

Intel will announce the 430HX and the consumer-targeted 430VX Triton chip sets this week.

The upgraded Bravo MS line will also feature 2MB of synchronous

graphics RAM, 16MB of Extended Data Out (EDO) memory, and an enhanced CommandCenter suite of software that will include network administration tools, Raybin said.

The systems will also come with 256KB of Level 2 cache and integrated audio. Though the systems will not come with a Universal Serial Bus (USB) connector, the 430HX chip set and AST's system board will support USB.

Both 1.2-gigabyte (GB) and 2.1GB hard drives will be offered; processor choices will include the 100-, 133-, and 166-MHz Pentiums. Entry-level

prices will remain on par with those of existing models and will range between \$1,800 and \$3,000.

AST will also refresh its Bravo LC desktops. The line is expected to be based on a unified memory architecture, sharing 16MB of EDO memory for graphics and regular RAM duties, Raybin said.

The LC line will add 160-, 133-, and 166-MHz Pentium chips. The systems will also come standard with 256KB of Level 2 cache and either an 850MB or a 1.2GB hard drive. Pricing will range between \$1,300 and \$1,700, AST said.

Is there ever a

good time

to upgrade your operating system ?

Finding the perfect time to migrate

is like finding the perfect time to mow the lawn.

However, finding the perfect reason is easy: value.

Upgrades have value insofar as they deliver dramatic improvements

improvements that outweigh the cost of deployment.

With the Microsoft® Windows® 95 operating system,

that value is demonstrable. And in what follows, we'll show you how it,

and the 32-bit applications that run on it, can reduce your support burden,

increase your control over the desktop,

and improve the productivity of end users.

In short, we'll address the issues that tend to forestall serious evaluation.

We'll even go so far as to suggest that waiting has costs of its own.

Support for IS.

Support for system administrators begins with support for end users. With its simplified interface, Windows 95 allows users to work far more independently than in the past. Simply put, the greater their autonomy, the less time you spend answering obvious questions.

But it's not just the interface that's improved; the whole system is more reliable. Thanks to the 32-bit protect-mode components of Windows 95, users can run multiple applications at the same time, without running out of system resources or freezing up their PCs. The same is true even if a network server goes down. And, with 32-bit applications now able to run in their own memory space, the likelihood of one app crashing another is almost nil.

What's the upshot of all this? Well, it won't exactly turn you into the Maytag repairman, but it can cut helpdesk calls by 7 to 14% a year.¹

Still, in designing a new OS, we realized that to make things easy for the end-user at the expense of the IS department would be self-defeating. And to that end, Windows 95 offers a variety of powerful tools to help you better manage your network and your time.

Built into Windows 95 are a number of tools to simplify administration. 32-bit versions of popular network clients,

like Novell® NetWare® are included, as is support for standard transport protocols like TCP/IP and device standards. Plug and Play support detects hardware devices as they are added to the system, which makes installation a snap. And, with Server-based Setup and Batch Setup tools, it's now possible to install and configure Windows 95 on multiple desktops from a server. Automatically.

Once you're wired, you can monitor performance and troubleshoot problems from a central location.

More support: more control.

System Policies in Windows 95 allow you to specify system settings and restrict network access and security privileges from a central location. So you can lock down desktop configurations whenever you see fit. And with User Profiles, individual users' desktop configurations are available wherever they log on to the network. This lets multiple users share one computer and "roving" users log on to other networked computers, while maintaining their own personal settings.

Again, with Windows 95, all of this can be done from a central location, reducing the number of on-site visits by 30 to 50%.² At last, you'll be able to focus on the big-picture stuff. So the next time someone asks you what's what with this Internet thing, you can say, *I have a plan.*

Productivity from the word Start.

The improved interface in Windows 95 makes nearly everything easier for novice and advanced users alike. Its Start button and task bar make applications more accessible. Long filenames make identifying files easier. Better tools such as Wizards and improved Help make learning features easy. Its right mouse button puts common commands a click away. And now that the separate Program Manager, File Manager, and Print Manager are gone, there are fewer concepts to learn. This makes for able, autonomous, and, dare we say, happy end users. People who require less training and support. Who, in short, can turn the desktop into the most tangible technology investment your company can make.

But Windows 95 isn't just easier, it's more responsive. Basic operations, like printing or accessing a file on a PC or over a network, are faster. And with its 32-bit multitasking capability, users can conduct file searches, online communications, or other tasks all while, say, editing a document. In fact, studies show that once users are familiar with the new OS, they're able to accomplish many tasks in about half the time it took under Windows 3.1.³

Of course, no one spends their entire day tooling around in their operating system. People have work to do. With that



Today, you can turn the desktop into the most tangible technology investment your company can make.



1. WorkGroup Technologies, Inc., a market research firm, collected and analyzed the helpdesk logs of 10 Fortune 100 companies in order to project the impact of Windows 95 on call avoidance, problem resolution, and on-site call reduction. The logs represented 100,000 PC users and 1.5 million helpdesk calls per year. 2. WorkGroup Technologies, Inc. 3. To quantify the learning curve from Windows 3.1 to Windows 95, and evaluate user productivity on Windows 95, Usability Sciences Corporation, an independent usability testing organization, had 75 beginner, intermediate, and advanced Windows 3.1 users complete tasks with both operating systems. They found that users were 93% more productive with Windows 95, and 94% more accurate. Tasks performed included: finding and opening files and programs, copying and moving files, and switching between active programs. 4. The MASIE Center, a recognized software training center and think-tank found that only one hour of briefing and two

The prevailing wisdom and why, this time, you should ignore it.

Common sense tells you to hold off on making the move to Windows 95, to wait until someone else finds the bugs. Well, someone else already has. With the largest beta program in history, Windows 95 was installed on more than a million desktops worldwide. Now, just six months into its commercial release, thousands of organizations are in pilot and rollout. And to keep them current, we've put together an online Service Pack with the latest drivers and other new components. In short, the dreaded "1.0 version" has already come and gone.

in mind, no evaluation of Windows 95 would be complete without simultaneously evaluating some of the 32-bit applications designed for it, such as Microsoft Office for Windows 95.

Now users can focus on their work instead of their software.

Office 95 is more than just fresh features on top of Office 4.x. It's a deeply integrated suite of applications. Integrated, both with the operating system and with each other. Because users can leverage their knowledge of one application throughout the entire suite, they need only three hours of training to be effective in all of them.⁶ Needless to say, this can dramatically reduce training costs.

But what about support? While it's one thing to get PC users up and running, it's quite another to teach them all the skills they'll ever need. And of course, you can't; users simply aren't interested. (Remember? They've got work to do.) Knowing this has made all the difference in designing Office 95. It's resulted in advances such as the Answer Wizard, which lets users ask the computer plain English questions like, *How do I print sideways?*, and then shows them exactly how to do it. As a result, you can expect a 48% reduction in Office-related help calls.⁵

With Office 95, users are not only able to work on their own, they're able to accomplish more things faster. Labor-saving features such as updated AutoFormat and Spell-It in Word, and enhanced AutoComplete in Microsoft Excel, not only render everyday tasks automatically, they

do so accurately. According to Kelly Services, the folks who train and supply corporations with over 325,000 temps each year, users complete their tasks 37% faster with Office 95. And they're 36% more accurate in doing so.⁶ Not a bad day at the office.



Why sooner is better than later.

If, as the headline says, there's never a good time to migrate, why make the move now? Why? Because deployment takes time.

Product reviews, network

configurations, lab tests, pilot programs, rollout — it takes time. And if the goal is to decide *Is it worth it?* and you continue to put off serious evaluation, it'll be that much longer before you begin to realize the productivity gains and cost savings that Windows 95 and Office 95 have to offer.

But let's assume you upgraded today. How long would it take to recoup your migration costs? According to a leading consulting firm, Office 95 will pay for itself in 10 months in medium-sized companies, and 12 months in large organizations.⁷ Factor in the increase in end user productivity, and those numbers fall by nearly half.

No question about it, the move to 32-bits is a big one. But as part of the larger evolution in chip architecture, hardware platforms, and application support, it's not one that you or Microsoft is making alone. Won't you join us?

How to start.

To receive a free copy of Trial 95 — including guides for evaluation and deployment, resource kits, feature reviews, and, of course, copies of both Windows 95 and Office for Windows 95, each with a 90 day license — call (800) 583-0042, Dept. A020. Or visit our Web site at www.microsoft.com. All the backup for the studies cited here is included, along with an ROI modeling tool so you can plug in your own numbers.

Windows 95 or Windows NT Workstation? Yes.

Both products are strategic for your organization. Together they make it possible for you to deploy Win32[®]-based applications, reduce your support costs, and make your end-users more productive — across all your desktops. The right mix for your organization will depend on your business needs and constraints. For guidelines on how to pick the right mix, go to www.microsoft.com/windows/mix.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™

hours of self-discovery were required to migrate Office 4.3 users to Office 95. 5. WorkGroup Technologies, Inc. 6. Kelly Services, Inc. conducted a controlled usability study of 35 employees who regularly use Office 4.3. Participants were measured for speed and accuracy in completing commonly performed tasks. 7. International Data Corporation modeled the expected returns on investment of Office 95 for large companies (1,000+ PCs) and for small-to-medium companies (100 PCs). On a cost-to-use basis, large companies will see their investment paid for in 12 months, small companies in 10. On a value-to-use basis, those figures drop substantially: 4.8 months for large companies, 5.3 months for small. © 1996 Microsoft Corporation. All rights reserved. Microsoft, Windows and Win32 are registered trademarks and Windows NT, the Windows Start logo, and Where do you want to go today? are trademarks of Microsoft. Novell and NetWare are registered trademarks of Novell, Inc.

OLE

Continued from page 1

debut in Windows NT 4.0 that will let developers build distributed applications using OLE components.

"Enterprise OLE lets you break up applications and put objects on different machines and work with them across systems to divvy up processing power," says Larry Joseph, CEO of Strategic Database Systems, a systems integrator in Utah, Texas.

The OLE interfaces accomplish this by separating business rules from graphical interfaces on the client and data management services running on the server.

"The big thing for us, if [Microsoft] can really put this scheme together, is that we will be able to use the same interface for both desktop application development and building distributed applications," says Bill Niemi, a technical consultant with Fidelity Investments Inc. in Boston. "That will really ease development and developer training issues for us."

But Enterprise OLE is not the only distributed component model. Even before the first external beta of Network OLE is begun, users are expressing concerns that the Enterprise OLE interfaces won't interoperate well with competing object architectures.

And some users are worried that Microsoft is being overly ambitious with Enterprise OLE.

"My general assessment of OLE is much less bullish than it was. I had great hopes with the whole thing, but I've slowed down because of the lack of products," says Pierre Pureau, first vice president at Republic National Bank, in New York.

Pureau currently uses the Common Object Request Broker Architecture (CORBA) sponsored by the Object Management Group (OMG) consortium to tie together server applications running on disparate systems. CORBA is the current standard for the server side of the object linking world.

Despite CORBA's head start, many users are eager to experiment with Network OLE.

"The OLE strategy will face some serious challenges, but it's extremely important to us for building distributed systems," says a CIO at a large Midwestern chemical maker who requested anonymity. "It's as complex as CORBA, but the development tools available for OLE are far superior."

The plan

Announced last spring, Enterprise OLE consists of Network OLE, OLE

DB, OLE Transactions, OLE Across Platforms, and OLE Team Development. Together Microsoft wants these interfaces to extend the existing desktop OLE model to the network, thereby allowing developers to reuse OLE components to write distributed applications.

Eventually, Microsoft officials say, Enterprise OLE will unscramble all computing pieces that are their underlying technology and let the separate pieces work together as operating system-independent "cooperating components."

■ **Network OLE** will be the core operating system service, the cross-platform plumbing that allows all the other interfaces to communicate across the network.

When an OLE interface makes a call to an OLE component across the network, it relies on Network OLE to do that by sending a remote procedure call (RPC) modeled after the

Open Software Foundation's Distributed Computing Environment (DCE) RPC. Network OLE also accounts for the security of internet-work component communications, using technology modeled after the OS's Kerberos security.

Windows NT 4.0 will also introduce the Domain Name Service (DNS), a global directory for tracking cross-platform objects and a critical piece of Enterprise OLE. "You need the [DNS] for distributed objects. It lets applications know where objects are located and will essentially make every PC a client and a server, since objects can now reside anywhere on the network," Joseph says.

■ **OLE DB** is an ambitious successor to Microsoft's Open Database Connectivity (ODBC) data access standard that will let all data be de-

fined as OLE objects. ODBC makes access from client applications to multiple back-end relational data sources possible via a single API. OLE DB will extend the ODBC model and provide access to nonrelational data such as spreadsheet files, Word documents, or any other data described as an OLE object. By including ODBC as a subset of the API, OLE DB will also maintain access to traditional databases.

■ **OLE Transactions** manages distributed OLE components. OLE Transactions consists of an API and several separate management applications, including the Distributed Transaction Coordinator (DTC) and Component Coordinator, that together manage requests and balance loads from client-based OLE applications against back-end data sources.

The first piece of OLE Transactions, the DTC, is set to appear in Microsoft's SQL Server 6.5 database release this spring. Although the DTC is only one element of the OLE Transactions solution for managing distributed objects, this first appearance in SQL Server will provide a C++ API to let developers begin writing distributed applications to the OLE Transactions interface. This means that developers who take advantage of the API will get a head start on distributed objects that will work with Network OLE.

■ **OLE Across Platforms** is a strategy for porting Windows applications and key OLE interfaces to non-Microsoft operating systems. The company has already enlisted four vendors to provide emulation and support for Windows applications via the Win32 API on Unix

and Macintosh. Microsoft has also signed up Software AG and Digital Equipment Corp. to port Network OLE and other OLE integration technologies to Unix, Macintosh, MVS, AS/400 and other OSes.

■ **OLE Team Development**, a set of interfaces, will define common interfaces for development tools so all OLE components can be stored in the same repository, regardless of the tool used to create them. The repository itself is being developed by Texas Instruments Inc. under Microsoft's direction.

Microsoft will support OLE Team Development through its own Visual Basic, Visual C++, and other development tools, but will also provide the interface specifications to third-party toolmakers.

The problem

Corporate developers say Enterprise OLE is essential if they are to build truly distributed Windows environments.

Like many IS shops, Fidelity uses the OMG's CORBA but says it will evaluate OLE for future projects because the collective Microsoft interfaces represent a standardized alternative to the variety of CORBA implementations on the market.

Although Microsoft is largely in a race to catch up with what the OMG effort has already achieved, CORBA is notoriously difficult to implement and changes to the interface require the cooperation of some 500 OMG members.

"I'd consider OLE as an alternative to CORBA. We'll switch from CORBA to OLE — if it becomes solid," Fidelity's Niemi says.

But as attractive an alternative to CORBA as Enterprise OLE seems, many users have already made significant investments in CORBA and worry that Microsoft won't make interoperability easy between distributed OLE and CORBA applications and that they'll be locked into another Microsoft-only strategy.

"The basic idea of OLE is very powerful, but it is still a single-vendor implementation," says the CIO who requested anonymity. "Microsoft is not licensing DCE security code, or the DCE RPC. They are using their own version. So I wonder how interoperable OLE really is."

Microsoft maintains that OLE is an inclusive strategy that will support technologies such as Java and that it will link to competing object strategies, including CORBA and OpenDoc. In fact, the company has been saying for two years it intends to define a gateway between OLE's underlying Component Object Model (COM) layer and CORBA.

But the COM-to-CORBA specification was recently delayed again because Microsoft failed to provide sufficient information about the COM underpinning to Network OLE, according to the OMG camp. (See "Bridge between Microsoft, OMG distributed objects on hold," *JN* 22, page 32.) Now, the specification is due by the end of this year, both parties say, but many observers suspect that the OMG-Microsoft feud is not over and blame it on Microsoft's reluctance to cooperate with an established standard.

"CORBA people will compete or cooperate. But Microsoft clearly is not going to accept a competing architecture," Joseph says. "They want the whole pie."

Fail to accomplish?

But Microsoft has wanted the whole pie before — and gotten it.

After all, users point out, even though OpenDoc is still defended by many as the superior model, OLE is already on clients everywhere. And Microsoft has its traditional tools to leverage: control of the operating system, ubiquitous and easy-to-use development tools, and in the case of OLE DB, a popular set of applications.

As a result, many have already resigned themselves to the idea that Enterprise OLE will become the most well-beaten path to distributed applications.

"NT 4.0 is rolling out. Microsoft already has OLE on the vast majority of client desktops," says David Greenberg, CEO of Visteon Corp., a systems integrator for the health care industry, in Maitland, Fla. "If they only get a fraction of the server market, they win."

Additional reporting by Martin LaMonica.

• We take a look at a beta of Windows NT 4.0 in Product Reviews, page 93.

ENTERPRISE OLE INTERFACES AT A GLANCE

■ **Network OLE**: Cross-platform communication architecture for sending remote procedure calls between OLE applications across networks.

Status: Will ship as part of Windows NT 4.0 this summer.

■ **OLE DB**: A universal data integration API that allows access to everything from spreadsheet data to relational and nonrelational data sources stored as OLE objects.

Status: Specification complete. Early release Software Development Kit for database vendors and other ISVs now available. Third-party vendors will begin this spring to release tools for corporate developers that incorporate OLE DB.

■ **OLE Transactions**: Development API and management applications that will manage and load-balance OLE

objects passing between client and server code segments of distributed applications. Will interoperate with transaction processing systems such as IBM's CICS.

Status: Full specification to be completed this spring. An early implementation in SQL Server 6.5, called the Distributed Transaction Coordinator (DTC), is due this spring. DTC will also be used in Microsoft's X.400 Exchange Server and Internet Information Service, as well as third-party financial management and other applications, starting next year.

■ **OLE Across Platforms**: Codevelopment project to port OLE and Network OLE to Unix, mainframe operating systems, and the Macintosh. Also defines gateways for linking OLE's Component Object Model to the Object Management Group's Common Object Request

Broker Architecture (CORBA).

Status: Microsoft Inc., Bristol Technology Inc., Infosys Solutions Inc., and Lotus Computing Corp. are working on tools that port the Win32 API, including OLE, to Unix and Macintosh. Software AG and Digital Equipment Corp. are developing Network OLE components for Unix and mainframe OSes for delivery by mid-1997. Specification for COM-to-CORBA bridge expected by year's end.

■ **OLE Team Development**: Interfaces to let development tools access OLE objects stored in object repository now under development at Texas Instruments Inc.

Status: Design preview due by year's end. Microsoft plans to implement the interface in its own development tools and make interfaces available to third-party tool developers this year.

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Database vendors adapt licensing to Web

By Mike Ricciuti

MAJOR DATABASE VENDORS are offering revamped licensing policies that will untangle complicated per-user licensing schemes and set new prices for database server software accessed through World Wide Web-based applications.

The vendors are attempting to adapt their licensing schemes to handle Web applications that could expose corporate databases to thousands of Web surfers.

Microsoft Corp. will announce this week an optional license, called SQL Server Internet Connector. Internet Connector will let an

unlimited number of users access a single copy of SQL Server via its Internet Information Server for a flat fee of \$2,995, said Gary Voth, group product manager in Microsoft's Business Systems division.

Oracle Corp. will follow suit later this month—but with a twist. The company will

introduce licensing options for Web access when it rolls out Oracle 7.3 on Feb. 26. Oracle plans to bundle its Web server with the Oracle 7.3 database at no additional charge, said Mark Jarvis, vice president of server marketing at Oracle.

But unlike Microsoft, Oracle will distinguish between Internet and intranet applications. The company will offer unlimited-access pricing, based on CPU class, only for database servers used for electronic commerce and other applications accessible via the Internet. Databases used in intranet applications will still be licensed on a per-user basis, said Jarvis, who did not specify pricing.

Sybase Inc. said last month it will adopt a new software licensing policy that includes an option to let users access multiple SQL Server databases through a networked connection. Previous policies restricted user access to a single server. Pricing has not been set.

Computer Associates International Inc. invoked a CPU-based pricing model in December for its CA-OpenIngres database that specifies a one-time fee based on server size, with unlimited access. Pricing starts at \$13,000 for Intel-based servers.

Informix Software Inc. is also said to be reformulating its licensing.

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INFOGUARD 100 WILL STEP UP ATM SECURITY

GTE NETWORK SYSTEMS CORP. and Cylink Corp. have teamed up to create a security device that will help remove a major hindrance to widespread adoption of Asynchronous Transfer Mode (ATM) technology.

The InfoGuard 100 cell encryptor will provide end-to-end protection of data through an ATM network by creating a virtual private network that functions as a secure "tunnel" passing through a public channel.

Because ATM is connection oriented, security has always been a concern; anyone who wanted to intercept a transmission would only have to determine the two connections at each end of a cell's path.

Connectionless technologies, such as frame relay, are inherently more secure because a message's packets are sent out at varying intervals across different routes.

InfoGuard will provide one of the first steps toward making ATM more attractive to mainstream users, analysts said.

"Early ATM adopters have made security a top priority," said Timothy Burke, research analyst with Yankee Group Inc., in Boston. "Because they've raised the issue now, by the time ATM reaches the mass market, [security problems] will have been addressed."

InfoGuard will comply with the ATM Forum UNI 3.1 interoperability standard. It will combine with an ATM switch to provide cell encryption as well as authentication, integrity, and misdelivery protection. It also will offer security on demand, which identifies connections as secure or insecure as soon as the link is set up and before transmission.

InfoGuard will ship in May; prices will start at \$49,950.

—Luc Hattestad

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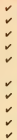
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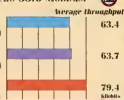
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Borland outlines Web strategy

By Martin LaMondia

HAVING FOUND ITS financial footing with the success of the Delphi development tool, Borland International Inc. last week outlined a strategy for its future growth that hinges on Java and the Internet.

The Scotts Valley, Calif., company outlined its plans to World Wide Web-enable its tools, middleware, and database and pledged allegiance to Java as its base language for both intranets and cross-platform distributed applications.

Borland will kick off the strategy in March with the release of the InterClient middleware (see related story, page 1) and a "just-in-time" Java compiler for 32-bit Windows that works in its Borland C++ 5.0 Development Suite. (See "Compilers in the works to boost performance," Feb. 5, page 1.)

The \$350 Borland C++ 5.0 Development Suite for 32- and 16-bit Windows will also include InterSQL Inc.'s PWCs version-control tool.

Borland is also working on several other Internet-related projects.

JDBC

Continued from page 1

Inc. and Visigenic Software Inc., have already pledged to support the interface.

JDBC will be similar to Microsoft Corp.'s Open Database Connectivity (ODBC) standard in that it will provide a standard mechanism for Java applets to access a range of different data sources, Sun said.

If middleware and database vendors sign on to support JDBC, Java developers will be able to tie their Java applets to back-end databases by writing to the JDBC API, sources familiar with Sun's plans said.

Java applications can use existing ODBC interfaces to connect to databases, but JDBC is tuned to Java and taps into the language's built-in communication capabilities, sources said.

In the second half of this year, the company will start beta testing a stand-alone tool for Java development, dubbed Latte, that will resemble Delphi but will be specific to Java. Both Latte and Delphi will work in conjunction with Nexus, Borland's application server middleware, to manage communications between distributed, partitioned applications, officials explained.

Next month Borland will also provide details about its plans for a server-based repository, due for delivery later this year, that will ensure access to multiple databases from Java applications.

An addition due this spring to Borland's Visual Database will convert relational data to Hypertext Markup Language (HTML). By the end of the year, the company will also introduce a visual "just-in-time" HTML tool, code-named Charlotte, that can be used in conjunction with Visual Database to dynamically map relational database data into forms, fields, and tables in HTML documents.

ities, sources said.

The creation of the specification is yet another step on Java's road to becoming a full-fledged client/server development language. (See "Java is getting stronger," Feb. 5, page 1.)

"JDBC is a new twist, because until now Java has been discussed in the context of an applet that is downloaded and runs in a Web browser without interacting with back-end data and services," said Stan Dolberg, an analyst at Forrester Research Inc. in Cambridge, Mass.

"It's an indication of what is rapidly happening: Java is maturing into a real development environment," Dolberg said.

Most Web servers now access relational databases by spawning a Common Gateway Interface (CGI) script for each database query, a method that uses network bandwidth and processing power inefficiently, sources and analysts said.

NetWare

Continued from page 1

Griffiths, director of product marketing in Novell's Internet Commerce division, in San Jose, Calif.

Taken together, these two projects will serve to better integrate NetWare with the Internet, an area where Novell has trailed other companies. For example, Novell currently only offers a limited-function Internet server for NetWare. (See review, Feb. 5, page 95.)

"They're playing catch-up in the Internet space," said Chris Galvin, an analyst at Hambrecht & Quist Inc. in San Francisco.

Novell has already demonstrated the ability to view NDS from a Netscape Communications Corp. World Wide Web browser. Support for Java in NDS would mean that an application could be built, for example, to act as an intelligent agent for network management.

"You could control access to applets just as you do now to files and directories," said Stephen Saxton, president of Saxon Data Solutions, a consulting company in

width and processing power inefficiently, sources and analysts said.

By contrast, Java applets written to the JDBC specification will establish a session with a specific database rather than rely on the Web server to negotiate database queries with a particular application, vendors familiar with Sun's plans explained. CGI scripts would still be used to distribute applets across the network.

Borland, for example, will provide a JDBC-compliant middleware product, InterClient, later this quarter that will let Java applets connect directly to its Interbase database through the JDBC interface. Because the specification assigns a specific database to the Java applet, JDBC will not be suitable for dynamically locating data across several unspecified databases.

But proponents say JDBC will still be faster than CGI-based database access, even after CGI middleware being developed by Sybase Inc., Computer Associates International Inc., and other database vendors arrives sometime in the first half of this year. (See "Database makers' ears head for the Web," Dec. 11, 1995, page 20.) This middleware will embed SQL statements directly in Hypertext Markup Language documents,

Piedmont, Calif.

NDS, in addition to supporting Java applets, will add support for multimedia objects and Common Object Request Broker Architecture-compliant components in 1997.

Additionally, different NetWare LANs will be capable of sharing portions of an NDS directory using a federated directories extension planned for 1997.

The Java effort is part of Novell's plans to extend NDS to the Internet and multiple operating platforms, Griffiths said. Novell is considering licensing Java from Sun.

But before NetWare sites run to embrace the Internet, they need to

learn to walk. For many sites, Sun's new IPX gateway in its WebSocket TCP/IP application suite, to be renamed WebSocket NW, may be the simplest and least expensive way to integrate the two environments.

For NetWare sites, the Sun gateway eliminates the need for a dedicated Internet server running NetWare. In addition, PC users would not have to load memory-intensive TCP/IP stacks, said Derek Maxwell, senior product manager for SunSoft's PC connectivity group, in Chelmsford, Mass.

WebSocket NW will cost about \$175 per user and will include a Windows DLL for PC clients as well as server component software.

Servers

Continued from page 1

Available now, IIS is Microsoft's counter to Internet servers from Netscape Communications Corp., which are primarily hosted on Unix servers running RISC processors.

In the coming year, Microsoft hopes to further frustrate Netscape by embedding IIS code directly into NT 4.0.

Similar initiatives have been taken by other OS companies, including The Santa Cruz Operation Inc. and Caldera Inc.

Microsoft, which says IIS runs Webstone 1.1 benchmarks four times faster than NT Web servers, will also put Netscape on notice by providing IIS at little or no cost.

Microsoft will make IIS available free on its bulletin board and will offer it as a \$99 stand-alone product in March. The software will also be included in the March release of the \$999 NT Server Network Value Pack. In contrast, Netscape's Commerce Server costs \$1,295.

One of the first companies to embrace IIS on NT using Pentium Pro-based systems is Intergraph. Intergraph introduced its Web server earlier this month and will ship it in April. (See "Internet hardware turf war heating up," Jan. 29, page 8.)

Zenith will start shipping its bundled NT/IIS solution this week, with the software preloaded and optimized on its Z-Server MX line of NT-based servers.

Prices range from \$9,399 for a Z-Server MX with a 100-MHz Pentium, 32MB of RAM, and two 1-gigabyte (GB) hard drives, to \$16,212 for a quad-processor Z-Server MX with two 166-MHz Pentiums, 64MB of RAM, and two 2GB hard drives.

Dell will also offer a bundled NT/IIS solution across its line of servers, with PowerEdge Web systems due in early March. An E server with one 100-MHz Pentium,

FTP PLANS NT WEB SERVER

FTP Software Inc. last week became the latest entrant in the Windows NT World Wide Web server market.

Like Microsoft Corp.'s Internet Information Server (IIS), FTP's Explaine, which is scheduled to ship next month, includes database connectivity tools for linking the Web server to Open Database Connectivity-compliant databases.

Unlike IIS, though, Explaine is not free, and FTP Software may face an uphill battle as customers are drawn to Microsoft's giveaway Web server on the Internet.

Explaine Professional Edition will be priced at \$445; Explaine Secure Edition with Secure Sockets Layer security will sell for \$1,195.

Additionally, Explaine runs on both NT Server and NT Workstation, making it attractive for small intranet workgroups. IIS is only on NT Server.

—Nick Wingfield

32MB of RAM, and a 1GB hard drive will cost \$5,959. A quad-processor LX with two 133-MHz Pentiums, 64MB of RAM, and two 4GB hard drives will cost \$20,893.

By comparison, a basic i5 Netra Internet server from Sun Microsystems Inc., with a 70-MHz MicroSparc II RISC processor, 16MB of RAM, a 535MB hard drive, and Internet server software, is priced at about \$6,000. Prices range as high as \$15,000 for the Netra line.

HP will announce its Internet NetServers this week but won't deliver them until early in the second quarter. In addition to using NT and IIS, HP will integrate Microsoft's Exchange as part of the Web solutions. The company will first deliver 133-MHz Pentium LC and LH models; pricing was not available.

Jason Pontin contributed to this story.

OPEN HORIZON LOOKS TO JAVA LINKS

In another attempt to provide back-end services to Java, Open Horizon Inc. is working on a link between Java applets and its shrink-wrapped middleware.

Open Horizon's \$99 Connection for Java, due in May, is a Java applet designed to handle communication between client-side Java applets and Open Horizon's Connection

middleware. Java developers can use the applet to piggyback the Connection middleware, thereby bringing security, database access, and directory and application server services to Java environments.

"This lets us go around our Web server, which is a bottleneck. And we can keep the application logic of our three-tier application on the server and

get all the cross-platform benefits of Java on the client," said Tom Sanfilippo, chief technology officer for Ohio State University, in Columbus.

The Connection middleware maps to native SQL and Open Database Connectivity interfaces but could also support Sun Microsystems Inc.'s Java Database Connectivity, officials said.

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PIPELINE

ANNOUNCED

Advanced Logic Research Inc. has announced desktop and minitower additions to its Optimizer entry-level line of PCs, based on the 100-, 133-, and 150-MHz Pentium chips, base system pricing ranges between \$1,245 and \$1,745 for systems with 8MB of RAM and no hard drive, (800) 444-4257.

SHIPPING

PRINTRONIX INC. announced last week a new family of line-matrix printers. The ProLine Series 5 printers include 3-D hammersprings, low power consumption, and frictionless parts. The ProLine series is a low-cost solution for mission-critical applications. ProLine 475LPM prices start at \$4,950; 800LPM pricing starts at \$7,495; the 1200LPM model costs \$11,500. (714) 863-1900.

Principal Decision Systems International (PDSI) is shipping MedSchd 3.0, a Windows 95 version of its patient management and scheduling software for medical offices and hospitals. MedSchd costs \$275; an enterprise version that works with back-end accounting systems is priced from \$795. PDSI plans to deliver scheduling software for other vertical industries this year based on its ScheduScheduling engine. (800) 851-7374.

MERGED

Stockholders of SEAGATE TECHNOLOGY INC. and CONNER PERIPHERALS INC. have approved the merger of the two companies. The combined company will use the Seagate name, officials said.

PRICE CUTS

APPLE COMPUTER INC. has slashed the prices of its consumer-oriented Perma line by as much as 12 percent. The cuts range from \$100 to \$300 and reduce the entry-level price of a Performa 6116CD with 8MB of RAM, a 700MB hard drive, a 14-inch monitor, and a dual-speed CD-ROM drive to \$1,499. (800) 776-2333.

CLIENT

Digital introduces chip for Internet, PDAs

By Sari Kalin

DIGITAL EQUIPMENT CORP. unveiled its StrongARM microprocessor last week, a low-power, high-speed chip targeted toward the Internet terminal and consumer electronics market.

The SA-110 is being pitched for the Internet terminal, personal digi-

tively, for orders of more than 10,000 units. Samples are available now; volume production is scheduled to start in the second quarter of this year, company officials said.

Although Digital did not announce any StrongARM customers last Monday, endorsements from a number of potential buyers, including Oracle Corp. and Apple Computer Inc., were reported.

Oracle plans to build a family of low-cost Internet appliances; it has already contracted with Acorn Computer Group Plc. to design one based on the ARM chip. Oracle officials could not be reached for comment.

Apple's Newton division worked with Digital in the chip's development; its current MessagePad uses the ARM 610 chip.

"We are very interested in the technology," said an Apple representative. "We're investigating it, and there's a very good possibility we will use it."

Analysts gave the chip positive reviews for its high performance and low power consumption.

Still, it is too soon to tell how StrongARM will fare against Sun Microsystems Inc.'s planned family of Java microprocessors, analysts said.

The Java processors, announced last week, will run only applications written in the Java programming language. (See "Java is getting stronger," Feb. 5, page 1.)

Java processor prices will start at less than \$25 and rise to more than \$100 for higher performance models.

"If you believe that Java as a language is going to be the greatest thing since canned beer, then the Java chips will also be successful,"

said Jim Turley, senior analyst with Microprocessor Report, based in Sebastopol, Calif.

"If, on the other hand, you think the Java language is going nowhere, then the Java chips will soon follow," Turley added.

Digital is located in Maynard, Mass., and can be reached at (508) 493-5111.

Sari Kalin is a U.S. correspondent for the IDG News Service.

NEW VIRUSES ATTACK WIN95 SYSTEMS

Two new viruses that attack Windows 95 systems surfaced last week, one relatively benign and the other potentially dangerous.

The new virus Boza can infect as many as three Win32 applications and displays a message from the virus' authors in a dialog box, Microsoft officials confirmed last week.

Antivirus utility vendor McAfee Associates Inc. has already posted a Boza fix on its World Wide Web site and Symantec Corp. plans to follow

suit this week, even though virus experts characterized Boza as relatively benign. Meanwhile, Sophos Plc., a software security company in Abingdon, England, reported last week a new Microsoft

Word macro virus that can destroy documents at random. The Winword/Hot virus spreads in the same way as the widely reported Concept, Colors, and Nuclear macro viruses, Sophos reported.

— Jason Pontin and the IDG News Service staff

Corel aims to dispel doubts with 32-bit upgrade of PerfectOffice

By Chris Jones

BETA TESTERS OF THE 32-bit version of PerfectOffice are eager to get their hands on an upgrade that offers new Internet and ease-of-use features, even though some still harbor reservations about the suite's

new owner, Corel Corp.

PerfectOffice 7.0 was scheduled to ship by the end of last year but was delayed when Novell Inc. decided to sell off its WordPerfect group. Corel now plans to help PerfectOffice users finally catch the

32-bit wave when it ships its Corel PerfectOffice 7.0 in April.

The upgrade will include 32-bit versions of WordPerfect, Quattro Pro, the Presentations business graphics application, the InfoCentral personal information manager, the Envoy electronic document exchange client, and Netscape Communications Corp.'s Navigator browser. The Professional version will also include the Paradox database and the GroupWise E-mail and calendaring client.

Many users said the new features are enough to retain their loyalty to the PerfectOffice platform, despite concerns from some that Corel lacks experience developing for the suite market. (See "Users leery of Corel suite plans," Feb. 5, page 6.)

"I fully expect it to be the best suite out there," said Andrew S. Brenner, a beta tester at a large Chicago law firm.

Corel last week focused on the suite's future role as an Internet document publishing platform, but

some beta testers said the upgrade is a credible contender against 32-bit suites already developed by Microsoft Corp. and Lotus Development Corp.

"It's every bit as tightly integrated as before and WordPerfect focused on making it work well with the Windows 95 interface ... The new features really take advantage of the operating system," said Read Gilgen, director of learning support services at the College of Letters and Sciences at the University of Wisconsin in Madison.

PerfectOffice 7.0 will feature

- single-click access to the Navigator browser from within all the applications;
- workflow functions for routing documents around a LAN;
- standard installation templates for network managers to control software setup as well as the ability to centrally distribute PerfectOffice copies from a NetWare server;
- "hotspot" graphical buttons that

InfoWorld Street Prices

Active matrix color notebooks

75-MHz Pentium notebook (Price)	Display size (Inches)	Hard drive (MB)	Low	High	Average	Change from December
AST Ascentia 950M	10.4	800MB	\$2,830	\$3,899	\$3,556	-6%
Compaq Lite 5000	10.4	810MB	\$4,689	\$4,869	\$4,743	-2%
Gateway 2000 Solo S5-75XL	10.4	540MB	Direct price	\$3,299	N/A ¹	
IBM ThinkPad 755CX	10.4	810MB	\$3,749	\$4,499	\$4,021	-12%
NEC Versa 4000C	10.1	540MB	\$3,549	\$4,000	\$3,829	N/A
TI Extensa 550C0D1	10.4	524MB	\$3,399	\$3,699	\$3,509	-1%
Toshiba Satellite Pro 400C0D	10.4	810MB	\$3,599	\$4,150	\$3,912	-5%
Zenith Z-Mate GT P75	10.4	810MB	\$3,399	\$4,108	\$3,891	N/A ²
Apple Macintosh notebook ³						
PowerBook 3300X/100	10.4	500MB	\$2,922	\$3,400	\$3,234	-7%

InfoWorld Street Prices are based on telephone surveys of resellers and on print advertising in computer publications and regional newspapers. Price information was collected between Jan. 28 and Feb. 2. 1. Pentium notebook includes 8MB of RAM, DOS, Windows, and an active matrix color display. A CD-ROM drive comes standard with the Gateway, TI, and Toshiba models.

2. Model not included in December pricing survey.

3. Apple Macintosh PowerBooks include 8MB of RAM, System 7.5, and an active matrix color display.

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- 15TX Monitor (13.7" v.i.s., 28Ni)
- Integrated 3Com EtherLink III
- Integrated Audio
- 3 Year Warranty

\$2671

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FieldWorks ships tough notebooks

By Brooke Crothers

FIELDWORKS INC. IS SHIPPING TWO NEW series of ruggedized notebook PCs.

The FW 5000 series and FW 7000 series are both highly shock resistant and designed to meet stringent military specifications for ruggedness.

The systems have a rigid, lightweight, one-piece magnesium-alloy chassis. Internal subsystems are protected from shock and vibration by rubber, which is molded to the magnesium superstructure, the company said.

The 5000 and 7000 series are based on a 486 100-MHz DX4 processor but are user-

upgradable to Pentium processors running as fast as 133 MHz, the company said.

The 5000 comes with four side-opening expansion bays that can house a combination of modules. For example, two 1.3-gigabyte hard disk drives can be inserted. CD-ROM drives and PC Card modules can also be inserted.



A RUGGEDIZED PENTIUM notebook from FieldWorks is priced from \$4,995.

The 7000 series comes with a built-in CD-ROM drive and a "backplane/card cage" design that provides six ISA slots for add-ins such as auxiliary test, measurement, diagnostics, multimedia, and communication cards.

Both series come standard with

- PC Card slots;
- a ruggedized, internal 340MB hard drive, also available in sizes of 510MB and 810MB;
- a graphics card with 1MB of 32-bit DRAM and support for 16.1 million colors; and
- a color 10.4-inch passive matrix LCD with an option for an active matrix display.

Supported operating systems include MS-DOS 6.22, Windows 3.x, Windows 95, OS/2 2.x, and Unix.

The 5000 costs \$4,995; the 7000 is priced at \$7,995.

FieldWorks, located in Prairie, Minn., can be reached at (612) 947-0856.

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Fault Tolerant

The "no single point of failure" design uses interchangeable and **hot swappable technology** with all system components. This ensures easy technology upgrades as they occur and on-the-fly network reconfiguration without network downtime. Each chassis is available with **dual in-line power supplies** and redundant cooling.

Each system is UL listed, FCC-B certified and CE compliant.

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All Series 700 products have a **3 year advanced replacement warranty**. Unlimited 1-800 toll free technical support is included.

Modular

Each system is easily tailored to your network via **plug-in Connectivity Modules and Drive Cells**.

Connectivity Modules are fully integrated hardware/software **plug and play** modules which provide **network direct connectivity** in **Windows NT**, **Novell** and **Unix** environments over **Ethernet** and **Token Ring** networks. In server based environments, other available connectivity modules allow 7 drives to appear as a **single SCSI ID**.

Drive Cells are interchangeable and allow you to simply plug in the **latest storage technologies**. Drive Cells currently include **Sony** and **Toshiba** fastest **CD-ROM** readers as well as **CD-R** and hard drives.

Complete

Everything you need to network CD's is included with each **Connectivity Module** or is available separately for server based systems. **Installation** and user access is easy utilizing **native** or **GUI** interfaces, **unlimited user licenses** and **multiple CD's** appearing as a **single drive letter**.

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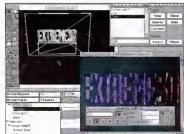
EXTREME 3D BRIDGES PC, MAC PLATFORMS

MACROMEDIA INC. will add some flair to the graphic artist's toolkit with **Extreme 3D**, an all-in-one 3-D modeling, rendering, and animation application that operates across both Windows and Macintosh platforms.

Built with the same interface as Macromedia's **FreeHand** desktop publishing application, **Extreme 3D** is a spline-based modeler that can render high-resolution animations across multiple machines in a network.

Extreme 3D is best suited for multimedia producers who need a fast, cost-effective way to add three-dimensional animation to their work, the company said.

Beta testers praised **Extreme 3D's** perfor-



EXTREME 3D uses a similar interface as Macromedia's **FreeHand**.

mance and cross-platform features.

"The graphics guy can send Mac stuff to PCs and vice versa," said Donald Grahame, partner at Grahame-Harding Productions, in San Francisco. "They're the first to do this for Windows NT and Mac at this price, and the rendering time is quite snappy."

Extreme 3D costs \$499. It runs on Windows 95, Windows NT, Windows 3.1, and Macintosh, upgrades from **MacroModel** cost \$199.

Macromedia, in San Francisco, can be reached at (800) 326-2128.

— Chris Jones

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OLE Automation	Yes	No	No
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Extended Stored Procedures	Yes	No	No
Rich Engine Cursors	Yes	No	No

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Visual tools developers plan to stir C++, Java together

By Martin LaMonica

START-UP SOURCECRAFT INC. and Sybase Inc.'s tools division Powersoft Corp. are both launching visual tools that combine C++ and Java programming in a single environment but promise better performance than fourth-generation languages (4GLs) such as Micro-

soft Corp.'s Visual Basic or Powersoft's own PowerBuilder.

SourceCraft is at work on an as-yet-unnamed tool that will let developers mix code written in both C++ and Java for release this fall. In the meantime, the company has announced two separate tools for C++ and

Java programming.

The first, ObjectCraft, lets developers build an application by constructing a graphical interface and then dragging and dropping buttons and database grids. ObjectCraft then generates C++ code that can be compiled by a third-party compiler.

A second tool from SourceCraft, NetCraft, sports the same interface as ObjectCraft but works specifically with the compiler in Sun Microsystems Inc.'s Java Development Kit (JDK) to generate Java code. The JDK compiler composes "byte code," or code that can be read by the Java Virtual Machine.

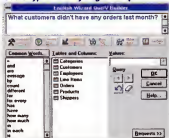
ObjectCraft is available now priced at \$1,995; NetCraft will ship in April priced at \$995.

Tools such as ObjectCraft will smooth the transition to programming in Java while offering better performance than existing 4GLs, said analysts and users last week.

"ObjectCraft is a step above PowerBuilder and Visual Basic but doesn't have the built-in distribution of Forte and Dymacsi," said Mitch Kramer, analyst at Patricia Seybold Group

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	...and more	

English Wizard includes the ability to automatically build an English dictionary for your database that you can refine and share with your users on a network. If questions are ambiguous, English Wizard will ask for clarification and always provides feedback on its interpretation of the request.

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SOURCECRAFT'S OBJECTCRAFT provides drag-and-drop programming tools for C++.

Inc., in Boston. "And as client/server matures, developers can recognize which language — Java or C++ — will be suitable for certain jobs."

Meanwhile, Powersoft will release in April Optim++ , a visual tool bundled with pre-built C++ components that allows developers to quickly build C++ applications as well as Java applets and other components for World Wide Web pages.

The company has not announced pricing. SourceCraft, based in Burlington, Mass., can be reached at (617) 221-5665.

Powersoft, in Concord, Mass., can be reached at (508) 287-1500.

PerfectOffice

Continued from page 25

appear in document margins for quick access to formatting options on paragraphs, graphics, tables and columns;

- new transitions and a preview window for Presentations' slide-show program;
- the capability to import and export HyperText Markup Language to and from WordPerfect; and
- the ability to link Quattro Pro cells to World Wide Web pages that will import and automatically update Quattro Pro files.

Some users especially appreciated the ease-of-use features, such as hotspot buttons.

"For heavy formatting, going back and forth to the toolbar is tedious, but now the hotspots make it much faster," said Ron Smith, owner of Caron Communications, a computer consulting and typesetting group in Chicago.

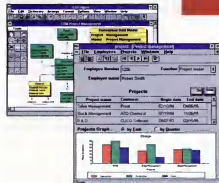
Corel is based in Toronto and can be reached at (800) 772-6735.

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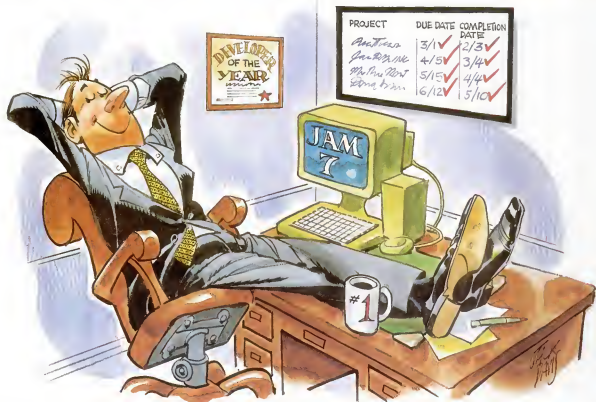


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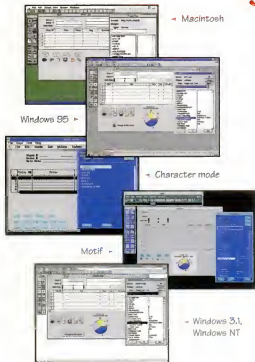
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WINDOW MANAGER · BRIAN LIVINGSTON

Predictions 1996: A wristwatch PC and a billion-dollar baby

LAST MONTH, I had the opportunity to address the Washington Software Association in Seattle. This group, which is composed of everyone from giant Microsoft Corp. to small development shops, invited me and other pundits to reveal our top predictions for 1996.

Since mine are the product of copious research, I thought you might enjoy reading what I think is in store for the world of Windows this year. Here we go...

■ **Prediction No. 9: The Internet Appliance.** Threatened by the plans of Oracle Corp. and others to introduce an Internet PC for less than \$500, Microsoft announces a PC for less than \$100 that is worn on the wrist. At this price point, the Microsoft Internet Wrist PC has only limited functionality: It dials the Internet and displays the correct time of day.

■ **Prediction No. 8: The MIPS Race.** Computer companies increasingly feed the pressure of Moore's Law, which states that computer power will double about every 18 months. This leads PC manufacturers to seek relief from the federal government. Sure enough, the U.S. Supreme Court rules Moore's Law unconstitutional.

■ **Prediction No. 7: The Billion-Dollar Baby.** This year, Bill Gates and Melinda French deliver a healthy baby boy. They name him Bob.

■ **Prediction No. 6: Talk Rocks On-Line World.** Former Crossfire commentator Michael Kinsley begins his new on-line magazine for Microsoft. His first guest is shock-jock Howard Stern, who explains how to search for dirty words on the Internet. An offended Jesse Helms passes a new law banning modems.

■ **Prediction No. 5: The High-Tech Baby Shower.** Warren Buffett and the Sultan of Brunel get together to buy Baby Bob Gates a little birthday present... Switzerland.

■ **Prediction No. 4: Can We Talk?** Someone finally looks up "giga-" in a dictionary and finds out that it is properly pronounced "jiga-", not "gigga-." The stock price of hard-disk manufacturers drops 25 percent in one day. A top hit song wins a Grammy: "You say jigga, I say jigga, let's call the whole thing off."

■ **Prediction No. 3: The Art World.** Hackers break into the computers controlling the multimedia screens on the walls of the Gates mansion. They reprogram the computers so that all the wall screens display paintings of dogs playing poker.

■ **Prediction No. 2: Out of the Mouths of Babies.** After the wall screens are debugged, Baby Bob Gates is surrounded by stimulating technology. This helps to enhance the little one's early grasp of language. His first word is "mama," and his second word is "data."

■ **Prediction No. 1: The Windows Century.** Ending speculation about its long-term plans, Microsoft announces that in the year 2000, it will release Windows 90. Widely referred to as "Windows oh-oh," the new product immedi-

ately leaps ahead of all other vaporware on the market, and sales of all software cease until the latest version can be obtained. Asked why he named the product "Windows oh-oh," Bill Gates replies, "We listened to our customers."

Tip o' the Week

The Windows 95 applets Notepad and Word-

Pad have an irritating habit. If you save a new file as plain text and you type in a name such as Myfile.txt or Document.asc, you get a long file name such as Myfile.txt.txt or Document.asc.txt. To prevent the extra .txt from being tacked on, type quote marks around your chosen file name: "Document.asc."

It's ridiculous, but it keeps these applets



from dictating your extension.

Brian Livingston is the coauthor of the new Windows 95 Secrets and author of three other Windows books (IDG Books).

Send tips to brian_livingston@infoworld.com or fax: (206) 282-1248.

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the time it takes to learn, the money that it takes to train, the elusive reuse benefits, the resistance to change, the constantly arising trouble spots, the long lead times required to build applications from scratch, complex low-level programming languages, lack of scalability, the shortage of talent, limited platform support, the performance penalties, deployment challenges, heavy maintenance, difficulty in comprehension, and the expense of manually reapplying your customization, object technology is quite beneficial.

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Disk defragmenting software from Executive Software Inc. has been released for Digital Equipment Corp.'s Alpha-based systems running Windows NT 3.51. Executive's DiskKeeper for Windows NT is designed to eliminate fragmentation for NT File System and File Allocation Table files under NT partitions. DiskKeeper eliminates fragmentation while disks are on-line and being accessed. DiskKeeper for Windows NT, Version 1.01, is priced at \$125 for Windows NT Workstation and \$399 for Windows NT Server. There's no charge for clients that store files on a server with DiskKeeper. (800) 829-6468.

MOBIUS COMPUTER CORP. has added World Wide Web functionality to its Alantira Series of Lotus Notes servers. The dual-processor AS/2000 and quad-processor AS/3000 are now shipping with Netscape Communications Corp.'s Communications Server, InterNotes Web Publisher, and Navigator as well as Lotus Notes 4.0. The servers are priced at \$10,995 and \$21,995, respectively, for entry-level systems with one 133-MHz Pentium processor, 64MB of RAM, and a 1-gigabyte (GB) hard drive. (800) 662-4871.

ANNOUNCED

TANDEM COMPUTERS INC. will announce this week its Information Delivery program for providing companies with decision support systems. The program will now offer 19 services, ranging from Project Definition to Data Warehouse Migration and Loading, priced between \$30,000 and \$50,000 each. The program will also offer five packaged solutions of databases bundled with Tandem hardware. The solutions will range from a \$284,000 Integrity server bundled with Oracle 7.2 and 50GB of storage to a \$5.3 million Himalaya system that will feature Tandem's Non-Stop/SQL parallel database and 1 terabyte of storage. (408) 285-6000.

SERVER

NetFinity gets Internet access

■ Seamless connection expected to spread to all IBM systems

By Ed Scamell

IBM WILL INTRODUCE an improved version of its NetFinity systems management software later this month that gives desktop users almost seamless access to the Internet.

The new version will be bundled with PC-based servers that IBM is also expected to announce later this month and will eventually end up shipping with most of the company's desktop and portable systems, sources said.

The network management software will now enable IS support staffs to peer into remote client machines to diagnose and fix problems over the Internet.

"They have done a very nice job of integrating [the Internet access] into the client component," said one analyst who saw demonstrations of the new version. "It naturally feels like part of the systems software. A couple of mouse-clicks, and you are out on the [World Wide Web]."

"With announcements like [IBM's], you can see it won't be long before management goes the way of the Web," said Frank Dzuback,

president of Communication Network Architects Inc., a consulting company in Washington.

It appears that IBM will get a leg up on Microsoft Corp., which has also talked about diagnosing and fixing problems over the Internet but has yet to deliver such a product.

IBM started bundling NetFinity with all of its systems in 1994 as a way to help IS shops save the time and expense of visiting far-flung parts of their companies to fix technical problems.

NetFinity is also designed to alleviate the problem of IS support staff visiting sites and being unprepared to fix problems because they do not have enough information about the problem before they arrive.

IBM is expected to bundle NetFinity with a 133-MHz Pentium-based server that will start shipping in March. The company will also announce a 166-MHz Pentium-based add-in card to upgrade existing PC-based servers, although that product will not be available until later in the first half of this year.

Company officials said they do

not expect to ship single- or dual-chip servers based on the 166-MHz Pentium Pro until late spring. Single- and dual-chip servers using the 200-MHz Pentium Pro will not ship until late in the first half or early in the second half of this year.

IBM is in Armonk, N.Y., and can be reached at (800) 426-2968.

NetFinity's expanding capabilities

- **Remote monitoring** detects and lists system capabilities, including memory, disk drive capacity, adapter cards, SCSI devices, monitor, redundant arrays of independent disks, and Level 2 cache.
- **Alerts** notify system administrators when specific events, such as changes to the CONFIG.SYS file or error messages, occur.
- **Troubleshooting** enables technical support staffs to diagnose and sometimes correct problems remotely.
- **Operating systems** supported by NetFinity are OS/2, NetWare, Windows 3.x, Windows 95, and DOS.
- **Protocols** include TCP/IP, NetBios, IPX, Simple Network Management Protocol.

RAID systems

Clarion powers up disk storage solutions

By Deborah DeVoe

THE 603E POWERPC chip is powering Data General Corp.'s latest enterprise-level redundant array of independent disks (RAID) solution.

The Clarion business unit announced its 20-disk C2800 and C2900 arrays last week, with shipments scheduled to begin in early March.

"For some time, Clarion had occupied an almost unchallenged niche in the higher end of the midrange storage arena, but other companies recently are starting to close the gap," said Bob Kativez, vice president at Disk Trend Inc., a research company in Mountain View, Calif.

"This announcement shows they're doing what they need to do to maintain their lead, with more powerful processors and an eventual move toward fiber," Kativez added.

The arrays feature the option of dual-storage processor boards, providing fail-over support and additional processing power. In addition, the redesigned storage boards double the performance of Clarion's



DATA GENERAL has beefed up its Clarion C2800 RAID array with a PowerPC 603E controller.

existing 20-disk noncache models, supporting 1,500 I/O operations per second, officials said.

Each board comes standard with a Fast and Wide SCSI-2 controller and 8MB of Level 2 cache, expandable to 64MB. Clarion will offer optional Level 2 cache memory upgrades as large as 256MB in May, officials said. The price will be \$100 per megabyte.

The arrays support as much as 84 gigabytes (GB) of storage and provide high-availability features, such as hot-swappable components and redundant cooling.

A 20GB C2800 with one storage processor board and 8MB of cache is priced at \$38,400; a 20GB C2900 with dual-processor boards, each with 32MB of read/write cache, is priced at \$56,055.

Upgrade boards for existing 20-disk arrays will be available in early March for \$12,550 each; a trade-in credit of \$2,000 per board will also be offered, officials said.

Data General, in Southboro, Mass., can be reached at (800) 672-7729.

SIEMENS TO LINK BACKOFFICE TO LARGE SERVERS

By Ron Condon

GERMAN ELECTRONICS GIANT Siemens Nixdorf Informationsysteme AG is working with Microsoft Corp. to help make Microsoft's BackOffice server applications fit in better with heterogeneous networks.

Siemens is planning to build a new development architecture by combining its own existing development tools, for systems ranging from workstations to mainframes, with Microsoft's OLE class libraries and technology borrowed from the Visual Basic development tool.

The new system will help developers easily create applications that run on top of Microsoft BackOffice server suites but are linked with a mixed range of larger servers, Siemens said. The goal is to help BackOffice in large-system environments.

"We expect to provide a tenfold increase in productivity with this approach, compared with using the bare development tools," said Peter Page, a member of the Siemens board that manages systems strategy and applications. "By enhancing the software development tools, OLE and BackOffice, Siemens Nixdorf will help to satisfy professional needs for powerful client/server solutions in a heterogeneous network environment."

The collaboration will first result in Siemens' ComUnity Application Implementation Framework, which the company plans to launch in July. The ComUnity framework provides tools for creating OLE-based applications on Windows-based systems and provides Siemens' Component Link Enabling technology to link these applications with applications running on higher end servers, Siemens said.

Microsoft intends to recommend ComUnity to its Solution Provider Developers.

Siemens said that several of its German customers, including Volkswagen and Deutsche Telekom, have already committed to using ComUnity.

Siemens can be reached in Burlington, Mass., at (617) 273-0480.

Ron Condon is a London-based correspondent for the IDG News Service.

HP-UX upgrade will provide preview of coming 64-bit Unix

By Judy DeMocker

USERS WILL GET A TASTE of a 64-bit Unix along with a first look at a Unix 95 operating system when Hewlett-Packard Co. ships its HP-UX 10.10 later this month.

The operating system also features the Common Desktop Environment interface,

support for Silicon Graphics Inc.'s OpenGL graphics library, and upgrades for diskless workstations using the Network File System architecture.

The Unix 95 standard, developed by X Open Co., establishes a common set of almost 900 APIs designed to make it easier for ISVs

to develop software, to increase the portability of applications, and to enable users to deploy one copy of software across multiple flavors of Unix.

"The main significance of Unix 95 branding is that it defines a set of APIs developed by vendors and developers," said David Valenta, HP-UX product manager for technical markets.

HP is not aware of any applications that have been developed for Unix 95, but it expects developers to support the standard.

A number of companies, including IBM, Digital Equipment Corp., Sun Microsystems Inc., and The Santa Cruz Operation Inc., are also planning to support the Unix 95 specification in their operating systems.

"Unix 95 simplifies software vendors' lives and makes the differences between the various ports of Unix and AIX virtually nonexistent," said Jay Bretzmann, an analyst at International Data Corp., a research company based in Framingham, Mass.

Other software vendors, such as those that sell databases or middleware, will gain little benefit from the standard, because those developers don't use standard system calls and write to the Unix kernel level, Bretzmann added.

The smattering of 64-bit Unix functionality included with HP-UX 10.10 is support for large data files, which can be as large as 128 gigabytes. The product will also support greater scalability with expanded file descriptors, which increase performance.

Support for larger data files should also ease migration to a 64-bit Unix, HP-UX, Version 10.20. HP officials declined to comment on when that operating system will be released but said it will feature larger file sizes.

Version 10.10 is due to ship Feb. 20. Pricing for the operating system has not been an-



UNIX 95 COMPLIANCE is the key feature of Hewlett-Packard's HP-UX 10.10.

nounced, but company officials said upgrade for current users will be free.

HP also announced the availability of two new additions to its midrange K-class server line, the K220 and K420, which feature a quadrupled cache size and improved performance.

The servers will ship with Version 10.10 of the HP-UX operating system by month's end. The K220 is priced at \$51,220, and the K420 costs \$73,200. In the meantime, prices include a two-user license for the current operating system, Version 10; additional licenses are priced at \$1,250 for eight users and \$4,900 for 32 users.

"It may not be sexy, but we are hoping that [the K-class servers'] reliability and purported performance will eventually be able to perform as the heart of the Canadian air-traffic control system," said Mike Levy, a systems engineer who is responsible for subcontracting and procurement for the Canadian Aircraft Air Transport System, at Hughes Aircraft Co. in Richmond, British Columbia.

HP, in Palo Alto, Calif., can be reached at (800) 452-4844.

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Pentium Pro servers

Intergraph sprints past server rivals

By Tom Quinlan

INTERGRAPH CORP. is ready to steal a march on its better-known competitors with plans to ship a line of Pentium Pro-based servers this month.

The symmetric multiprocessor InterServe MP Servers will feature four models running under Windows NT 3.51 and featuring Pentium Pro processors running at 150 MHz and 200 MHz, the company said.

The 150-MHz systems will scale from one to two processors, the company said, with prices starting at \$13,900.

The entry-level system will include a single processor, 64MB of RAM, a 2-gigabyte (GB) hard drive, six PCI slots, and four ISA slots.

A higher-end single-processor model features built-in support for a redundant array of independent disks (RAID) and internal hot-swappable drives; pricing will start at \$23,400. The RAID support takes the place of one of the PCI slots.

Intergraph's 200-MHz Pentium Pro-based models start with two processors, 4GB hot-swappable drives, a PC Card connection, dual power supplies, RAID, and a minimum of 64MB of RAM.

The 200-MHz systems will come with four PCI slots and three ISA slots and feature built-in high-availability features for software and hardware. Prices for these systems, which can support as many as four processors, start at \$39,900.

All the systems can support a maximum of 1GB of RAM and come with a quad-speed CD-ROM drive and a graphics card.

Intergraph is also offering a more expandable rack-mounted version of its 200-MHz Pentium Pro system that supports as much as 3GB of RAM, three PCI bus interfaces with 10 PCI slots and three ISA slots, and an 8GB hard drive. Prices are expected to start at \$37,000.

Intergraph, based in Huntsville, Ala., can be reached at (800) 763-0242.



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OLAP vendors offer access to databases via Web browsers

By Mike Ricciuti

ON-LINE ANALYTICAL processing (OLAP) tool vendors climbed aboard the Internet bandwagon at last week's Data Warehousing Conference, in Orlando, Fla., by introducing tools that let users query their OLAP databases over the World Wide Web.

■ Dimensional Insight Inc. introduced DataFountain, an OLAP server that summarizes data from relational and other databases and presents it via standard Web browsers. DataFountain can also be accessed via the company's existing client software. It will ship in April priced at \$3,750.

■ MicroStrategy Inc. announced DSS Web, an add-on to the company's existing DSS Server OLAP server. Like DataFountain, DSS Web is designed to make decision support data available via standard Web browsers. The tool, set to ship next month, will be available as part of a \$50,000 package that includes DSS Server or

as a \$15,000 add-on for current DSS Server owners.

■ Information Advantage Inc. is working to deliver this summer a \$29,995 server called WebOLAP. The new offering will combine the company's current DecisionSuite OLAP server with Web access tools.

The company also announced the Web-OLAP Content Server, an all-in-one data warehousing package that bundles the DecisionSuite Server, Web access tools, and Red Brick Systems Inc.'s Red Brick Warehouse data warehouse software, priced from \$40,000.

The OLAP servers from all three vendors run on Windows 3.x, Windows NT, and Unix servers.

Dimensional Insight, in Burlington, Mass., is at (617) 229-9111. MicroStrategy, in Vienna, Va., is at (703) 848-8600. Information Advantage, in Minneapolis, is at (612) 820-0702.

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in Unauthorized Windows 95
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"If Windows is a big labyrinthian cave, then this book is for those of us who want to venture farther into the cave than the Win32 API will take us. Matt is the foremost guide to the innermost caverns of Windows 95."

Eric Maffei,
Editor-in-Chief
Microsoft Systems Journal



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LAWSON C/S SUITE TO GAIN THREE-TIER WORKFLOW TOOLS

LAWSON SOFTWARE WILL ADD its name to the list of client/server application vendors incorporating workflow capabilities into their products with an upcoming release of its Open Enterprise line of software.

The Minneapolis-based company recently demonstrated to key users an early version of its three-tier workflow technology that will be available later this year as part of Lawson's Open Enterprise line of financial, human resources, materials management, and distribution management applications.

The company plans to offer scalable workflow capabilities that users can implement as needed.

Version 7.0 of Lawson's application suite, expected to ship late in the second quarter, will enable users to implement workflow capabilities on three integrated levels: the desktop, the workgroup, and the enterprise.

"[Lawson's] workflow approach allows you to make changes on the fly," said Don Carlos, director of systems and communications at St. Joseph Medical Center, in Burbank, Calif. "It's in the very initial phase, but the theory and methodology are very sound."

Lawson's enterprise-level applications include an open set of APIs in which users can integrate a third-party workflow engine, or the company can provide an embedded workflow solution. Users can define workflow processes at any one of the three levels.

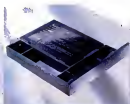
"As the business process changes, I need to scale up and scale down," said Ed Black, director of client/server applications at Aberdeen Group Inc., in Boston. "With one size and one model, it becomes more difficult to maintain the flexibility and scalability."

Lawson can be reached at (612) 379-2633.

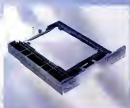
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KYOCERA SUCCESS STORY #559

BACKGROUND: Switched from HP to Kyocera. Recently purchased 150 Kyocera "cartridge-free" printers.

KYD-SAVINGS: More than \$100,000 in the first year.



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HELP DESK • BRETT GLASS

Buy servers with 512KB of external cache for best value

Some competitively priced computers, including some sold as servers, have no external (Level 2) cache. Will they perform much more slowly than machines with cache? How much does an external cache typically cost?

S. Kumar

Several readers have called with the same question. I can't emphasize this enough: If you want to get a reasonable amount of bang for your buck — and especially if you plan to use the machine as a server of any kind — do not touch any computer without a secondary cache. A synchronous or pipeline-burst secondary cache cuts the time required for some 90 percent of RAM accesses by more than half — a huge savings that can't be realized via faster CPU clock speeds.

If a vendor attempts to convince you that machines with Extended Data Out RAM don't need external cache, find another vendor. The price difference between a machine without external cache and a similar one with external cache should be at most a couple of hundred dollars. It's worth the price.

On a server, make sure the cache is 512KB or larger. (Compaq Computer Corp. is one of the few system manufacturers that still makes its own motherboards; it can therefore offer machines with 1MB of external cache.)

Finally, if you order a Pentium Pro server, make sure to get a Pentium Pro with a full 512KB of secondary cache on board. Intel Corp. has recently introduced some bargain versions of the Pentium Pro with only 256KB of cache — too little for a high-powered server CPU with a 64-bit data bus.

How many interrupts and DMA [direct memory access] channels does a PC-compatible computer have? Can they be shared? Why can't I use DMA channel 0 on my PC?

Mark Johnson

The original IBM PC had one group of eight hardware interrupt requests (IRQs) and four 8-bit DMA channels; the PC/AT added another group of eight IRQs and four 16-bit DMA channels. Not all are available for use, however. IRQs 0, 1, and 8 are dedicated to motherboard hardware. IRQ 13 is used for floating-point math. IRQ 2 is used internally to bridge the two groups of eight IRQs. (From the peripherals' point of view, IRQ 2 and IRQ 9 are the same, so avoid the common mistake of setting one board to use IRQ 2 and another to use IRQ 9. You'll get a conflict.) IRQ 14 is often (though not always) used by an AT-compatible hard disk interface. The original ISA bus did not let peripherals share IRQs. Newer buses, such as EISA and PCI, can. But because most software isn't designed to support sharing of IRQs, it's usually not possible to share them safely. It's also a bad idea to try to share DMA channels for the same reason.

DMA channel 0 was originally used to refresh DRAM on the IBM PC/AT motherboard. Although it's no longer used for this purpose, it can't be used for peripherals because it is not wired to the bus slots on the motherboard. Today, DMA channel 0 is most often used by OSes to copy data between extended memory and conventional memory, because — unlike the CPU — it can move

the data without a time-consuming CPU mode switch or ring transition.

Amplification

Several readers have called to mention that Apple Computer Inc.'s Easy Access software, which comes free with System 7, includes some screen enlargement facilities. They're not as extensive as those provided by



third parties, but they're useful for many visually impaired individuals.

Brett Glass' Help Desk answers business computing questions. To submit a query, call (800)227-

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Meridian Data Inc. has delivered CD-ROM sharing software for NetWare networks. CD Net 1.0 for NetWare and CD NetRecovery 1.0 for NetWare enable multiuser, simultaneous access to CD-ROMs and provide services such as recording. The two products are built as NetWare Loadable Modules. CD Net for NetWare, available now, has a suggested list price starting at \$795 for a 25-user license. CD NetRecovery, due by ship this month, requires CD Net for NetWare and costs \$995 per server for an unlimited-user license. Meridian also is offering an enhanced version of its CD-ROM-sharing software for Windows NT, adding remote administrative tools and end-user tools for accessing CD applications. CD Net 2.0 for Windows NT, due this month, costs \$995 per server. Client software starts at \$795 for 25 users. (408) 438-3100.

XYPLEX INC. shipped last week the RouteRunner, a multiprotocol bridge/router that connects branch offices to corporate networks and to the Internet. The synchronous model features one LAN and two WAN ports and costs \$1,495. The ISDN model has one LAN and one WAN port and costs \$1,395. (508) 952-4700; <http://www.xyplex.com>.

ANNOUNCED

ALANTEC INC. announced last week four new Fast Ethernet modules for its PowerHub product family. The 6x1 universal module occupies one slot in the PowerHub 7000 and provides six Fast Ethernet segments for \$5,950. The 2x8 microsegment module supports two Fast Ethernet segments in the 7000 with eight connections per segment for \$7,950. The 1x12 and 2x12 microsegment modules support one or two Fast Ethernet segments, respectively. The 6x1 module is shipping now; the others will ship in the second quarter. Pricing was not announced for the 1x12 and 2x12. (800) 252-6832; <http://www.alantec.com>.

Routing giant making switch

HOTSEAT John Chambers, CEO of Cisco: 'It's not routing or ATM switching... It's internetworking that's winning.'

NEW TECHNOLOGY is changing the rules of the networking game, and routing giant Cisco Systems Inc. is now trying to dominate areas such as switching.

President and CEO John Chambers has held the position for the past year, which has seen Cisco buy a clutch of smaller vendors. Michael Parsons, a U.S. correspondent with the IDG News Service, spoke to Chambers about competition in the inter-network arena.



Switching was supposed to supplant routing, but routing's never been so popular. What's going on?

It's not routing or ATM [Asynchronous Transfer Mode] switching or Fast Ethernet: It's really internetworking that's winning. We heard the critics and we were going to go with a combination of routing and ATM switching.

So which technologies will dominate? It will be a combination. Fast Ethernet next year will outsell ATM at the workgroup 10-to-1, and for each set of Fast Ethernet switches we sell, it pulls a 7500 router. So there are places in the Internet where switching is more effective and where routing is more effective. People forget that a router is a switch with a lot of software. If all you want to do is move cars around the information superhighway, then a switch is fine. If you really need a software intelligence to make decisions, then you need the routing, or a combination of the two. Routing is growing well and will continue to grow in spurts as the infrastructure gets built out. Our company will use a combination of routing, switching, and

hubbing. We have no particularly strong religion.

Now is the product mix shifting between core routers, edge routers, and switches? The switches are the fastest growing sector. Our switching products are currently [generating] more than \$600 million on a run rate of more than \$3 billion. Routing and switching are going to blur.

Does that mean that the demand for high-end routing is slowing down? We continue to see good growth in routers, but if we are doing our job well, we are becoming a total internetworking company. We have not seen high-end routing slowing down, but it is not growing at the same speed that switching is. Pundits see high-end routing doubling in four to five years — although we don't forecast 120 days out, so I don't know how they do that.

Rivals such as Bay Networks Inc. are perceived as having less reliance on routing in their product mix. Does that bother you? When you look at the numbers [Communications Inc.] and Wellfleet [Communications Inc.] combined, they are now 10 percent bigger than us. We are now 60 percent bigger than Bay. If you look at our percentage of the switching market, depending on whose numbers you use, we are between 30 [percent] and 40 percent of the total switching market.

How well will you go in the consumer market? Will you launch pocket-size home routers for viewing World Wide Web pages?

Mixed routing and switching and
 > HOT SEAT page 50

Novell advancing OS

■ Plans for NetWare replication in 1997

By Paul Krill

NOVELL INC. is racing to add replication services to its network operating systems before Microsoft Corp. can deliver a similar set of services in Windows NT.

At the Brainshare conference in March, Novell will detail its plans for adding replication to NetWare in a release, code-named Moab, due out in 1997.

In this release, Novell will debut a NetWare Advanced File System (NAFS) that promises to add replication services directly to the operating system.

Today, most replication services are provided at the database level. Lotus Development Corp.'s Lotus Notes, for example, makes heavy use of replication to synchronize databases across its groupware architecture.

"That's one of the features that you have in Notes that I really like a lot," said Michael Kaunitz, director of networking at Donovan Data Systems Inc., a data services company based in New York.

By adding these capabilities to NetWare, Novell is effectively making NetWare a distributed operating system, Novell said.

"A distributed file system gives you the ability to replicate," said William Donahoe, Novell senior director of product marketing in Provo, Utah.

Novell currently offers replication

services in its NetWare Directory Services, but adding them at the OS level will make these services available to any application.

Replication is more useful at the OS level than at an application level because users could replicate any database, such as a SQL database, instead of a particular application such as Notes, said Rob Enderle, an analyst at Giga Information Group, in Santa Clara, Calif.

With NAFS, file replication will be seamless and automatic, and users won't need to know the location of a file, Donahoe said.

"You'll just go to your data. You don't need to know where your data is," Donahoe said.

The new file system will include a utility for administrators to set up file synchronizations, Donahoe said. Existing files will not have to be modified to work with NAFS, he said. Another side benefit is that users would no longer have to deploy Novell's System File Transfer III software to provide a dedicated backup server for files.

But Microsoft vows to at least match Novell byte for byte with a new object file system of its own in the Cairo release of Windows NT in 1997.

Cairo also will have full file location independence, enabling multiple replicas of the same data to exist in a network.



HP consolidating OpenView

By Mark Leon

MOVING TO SIMPLIFY a confusing mix of products, Hewlett-Packard Co. is consolidating the packages in its OpenView family of network and systems management software.

Network Node Manager, HP's SNMP network application, and Operations Center, HP's systems management software, will become IT Operations.

Network Node Manager and AdminCenter, HP's application management suite, will become IT Administration.

The more significant effort is IT Operations, which is aimed at system managers who need to access network data, company officials said.

If an Oracle Corp. server goes

down, for example, the operator could double-click on the appropriate systems icon and bring up a map of the affected network segment. HP calls this an integration of logical systems and topological network information.

Previous versions of Operations Center allowed users to view the network by application or logical function, and Network Node Manager has always produced network infrastructure maps, but the ability to combine these views in IT Operations is new.

Users said the integration and consolidation are needed.

"The OpenView family has been a confusing mix of disparate applications. We use both Operations

> HP page 50

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Comprehensive offering

Cisco readies suite of remote-access products

By Luc Huestead

CISCO SYSTEMS INC. is taking another step toward becoming an end-to-end provider of networking equipment by launching a suite of remote-access products.

Included in the offerings are the AS5200 Mixed-Media Universal Access Server, the CiscoSecure Server, dial-up software, and remote routers, all of which give Cisco a more complete product line, analysts said.

"The company is trying to have as comprehensive a product suite as their competitors," said Bobbie Murphy, an analyst with Dataquest Inc., in San Jose, Calif. "This announcement is targeted at Internet service providers, carriers, and corporations with large enterprise networks."

The AS5200 enables users to connect via ISDN or through a standard telephone. It offers support for multiple modem technology, centrally managed modem capabilities, and access protocols such as Internet Protocol, IPX, AT, Point to Point Protocol, SLIP, X.3, X.28, and X.29. The CiscoSecure Server is a cen-

tralized security server for integrated authentication, authorization, and accounting that offers controls for access, security, and billing.

The new PC dial-up solutions include Version 2.0 of both Cisco-Remote Plus and CiscoRemote Lite management software, as well as three new Cisco 200 Series remote node routers.

The 202 allows desktop users to access the LAN or the Internet via ISDN, and it has a built-in NT1 device; the 203 and 204 are bundled with CiscoRemote Plus.

The AS5200 will ship in the second quarter for \$37,500. A 16-port version of the CiscoSecure Server will ship in the first quarter for \$4,200. The CiscoRemote software will ship in the second quarter. The Plus version will cost \$199, or \$49 for an upgrade, and the Lite version will be free with a CiscoRemote Access server product.

The 200 Series is available now. The 202 costs \$550, the 203 costs \$650, and the 204 costs \$695.

Cisco is located in San Jose, Calif., and can be reached at (408) 526-4000.

By Luc Huestead

HOPING TO CONVINCE network managers that now is the time to deploy Asynchronous Transfer Mode (ATM), 3Com Corp. and IBM have rolled out a series of devices and services.

3Com's lineup includes Ethernet/ATM and Token Ring/ATM switches and a workgroup ATM switch with a 25Mbps concentrator, bridges, modules, and interface cards.

IBM announced a 25Mbps ATM switch and adapter that delivers ATM to the desktop for the low price of about \$495 per seat.

Both rollouts are attempts to counter the conventional wisdom, which suggests widespread adoption of ATM is still years away.

3Com's ATM switches

Product	Available	Price
LinkSwitch 1000	2nd half	N/A
LinkSwitch 2700	Now	\$8,400
LinkSwitch 3000	2nd half	N/A
LinkSwitch 2000	2nd half	N/A
Celplex 4000 workgroup switch*	June	N/A
OnView concentrator	Now	\$4,395
LinkSwitch 2500 chassis hub	June	N/A
OnView bridge	Now	\$9,895
Celplex 7000 switch	Now	\$15,200
LinkSwitch 4000 switch	2nd half	N/A

*ATM modules and interfaces for Celplex will all ship by the third quarter.

Several recent studies have predicted that ATM proliferation by the year 2010 will have reached no more than 55 percent; other reports have made estimates closer to 30 percent. (See "Switched off," Jan. 22, page 1.)

Of all the offerings, the 25Mbps ATM appears to have the most near-term usefulness, analysts said.

"In the last quarter, we've seen sales of 25Mbps ATM come into their own," said Trudy Barker, an analyst with Dataquest Inc., in San Jose, Calif. "A lot of Token Ring users are migrating to it, and it appeals to people with video and other high-bandwidth needs."

3Com's initiative, which provides ATM functions across virtually all its product line, has gathered support from some 25M.

"We were originally looking for an enterprise-wide solution," said Matt Spencer, director of networks and telecommunications at the University Hospital, in Denver.

"3Com's LAN emulation performs well; we broke a lot of other vendors' ATM equipment during testing."

Among the 3Com highlights:

■ The 7200 Ethernet/ATM interface card for the Celplex 7000 switch enables it to be used either as a backbone switch or a closet device, and a card-equipped 7000 can support as many as 48 switched Ethernet ports and 12 ATM ports. The card also comes in a fiber version.

■ Version 2.2 of the Celplex network management software has enhanced Information Infrastructure Standards Panel support, with automatic routing table configuration, load sharing, and redundancy.

■ Support for 25Mbps ATM for adapter cards, a 12-port interface, the OnCore switching system, as well as an expansion of the Celplex 4000 with 16 25Mbps ports and 155Mbps links.

Separately, IBM unveiled the 25Mbps ATM 8285 Nways workgroup switch, an ATM launch kit, a 25Mbps ATM concentration module for the 8260 hub, and a 12-port 25Mbps ATM module for the 8260.

The 8285 is designed for as many as 48 workstations. It has 12 25Mbps ports and an uplink to 155Mbps ATM. The launch kit includes an 8260 hub, an 8281 Nways ATM LAN bridge with a 100Mbps ATM module, and a client PC300.

3Com Corp., in Santa Clara, Calif., is at (408) 764-5000. IBM can be reached at (800) 426-2255.

Hot Seat

Continued from page 47

hubbing will occur at the low end as well. We intend to go to the desktop. You should look for us to expand our relationships with Intel [Corp.], Sun [Microsystems Inc.] and others. We are interested in the home through our partnerships. When you think of the Internet, you think of names like Netscape [Communications Corp.]. In fact, we handle 80 percent of the traffic.

Your acquisitions have made some people scratch their heads. Why did you buy Kalpana Inc., when most think Altecnic Inc. had more sophisticated technology? We offer the broadest range of functionality in each area. There are going to be certain companies that want a chassis-based, modular approach. That's why we bought Crescendo [Communications Inc.]. There's a stackable solution, which we've accomplished with Kalpana, and there will be others who want a much better price point, and that's Grand Junction [Networks Inc.]. You will see our software move through all these different levels. That's a much better line than

Altecnic has. We offer the broadest line and we have achieved the biggest market share, and the combination speaks for itself.

Fore Systems Inc. has a great reputation. Xylan Corp. is doing well, but LightStream Corp. [Cisco's ATM switching operation] doesn't seem to have set the world on fire. What do you make of that?

We split ATM switching into a number of markets: desktop, cam-

pus, WAN access, and central office. There are different players, price points, and functionality in each area. At the workgroup, our key competitor is Fore; they're starting to move up to the campus enterprise. At the WAN access switch level, you have StrataCom [Inc.] and Cascade [Systems Inc.]. LightStream is at the campus backbone and also has WAN access switch. We are pleased with LightStream.

HP

Continued from page 47

Center and Network Node Manager, and it isn't always clear whether a problem comes from a system or network event, so the ability to see both in the same browser will be useful," said an IT manager at a New York brokerage house. "But if it means that we can no longer use either product separately, that could be a problem."

IT Operations can be tailored to give network-centric or systems-centric views only, according to HP officials.

IT Administration is little more than a bundling of AdminCenter

and Network Node Manager. AdminCenter, which shipped last July, includes software distribution, Unix system administration, and network inventory applications.

Currently, AdminCenter APIs are proprietary, but HP plans to open them up to third parties such as Oracle and SAP AG.

Network Node Manager will continue to be sold separately for customers who only want network management, but Operations Center and AdminCenter will no longer be available as separate products.

IT Operations will ship in May; prices start at \$40,000.

IT Administration will ship in June for \$26,000.

HP can be reached in Palo Alto, Calif., at (800) 452-4844.

Platinum and Dazel to pair up

By Mark Leon

TWO MANAGEMENT software companies will team up to offer users more control over the distribution of information across networks.

Systems management vendor Platinum Technology Inc. will integrate its network job scheduling and software distribution applications with server software from Dazel Corp. that manages print, fax, page, and E-mail processes across Unix networks.

The API-level integration between Platinum's AutoSys (a network job scheduling application) and Dazel's Output Server is scheduled to be available by midyear.

This integration will allow different versions of a financial report, for example, to be automatically sent to various locations via E-mail.

Users said the integration could bring a more robust style of job management to networks.

"I'm an old mainframe guy," said Mike Mueller, computer consultant with Wisconsin Electric Power Co., in Milwaukee.

"We wanted a JES2-like [Job En-

try Subsystem for IBM's MVS OS] solution to manage large-volume distribution for our network, and it sounds like this is a logical step in that direction," Mueller added.

Output Server will also be integrated with Xfer, Platinum's software distribution tool, to help get the most current version of an application to specific nodes in the network.

Beyond the API integration, Platinum plans to incorporate Dazel source code into the Platinum Open Enterprise Management Software systems architecture.

Prices for AutoSys start at \$9,000 per server and \$750 per client.

The Xfer administrative server costs \$9,500.

Prices for remote Xfer servers range from \$75 to \$750.

Dazel Output Server, with support for five servers and as many as 100 clients, costs \$420 per client.

Platinum, located in Oakbrook Terrace, Ill., can be reached at (708) 520-5000.

Dazel is located in Austin, Texas, and can be reached at (512) 306-7300.

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LAN TALK • PAUL MERENBLOOM

A cheap, fast way to get data on-line and under control

WOULD YOU LIKE to make your users happy, reduce telephone line charges, improve response time to on-line service providers, improve control of network traffic, and eliminate a whole bunch of remote-access bypass routes that could scuttle your security plan?

If your answer is "yes," I have a great tip for you this week.

Our users — like yours, no doubt — are addicted to America Online (AOL), the World Wide Web, and CompuServe. To support these services, we added modems and phone lines to tens, if not hundreds, of PCs. But the modems quickly became outdated. We also had the usual worries about traffic.

Then management decided it wanted IS to track and control outside communication, and to take steps to reduce the risk of data floating outside the organization. The idea was to try and prevent industrial espionage. An impossible dream? Nope.

The solution was to take one-part fire wall, one-part Internet connection, one-part ISDN line or a higher-rated link, and combine it with a TCP/IP stack on a user's workstation. Then add CompuServe's WinCIM 2.0 and Version 2.5 of AOL's browser.

CompuServe and AOL both support TCP/IP as a transport method natively and now support the WinSock standard as well. So I eliminated the slow 28.8Kbps modem line and connected to CompuServe at 1.544Mbps. Not bad.

So I got great speed, great response time, happy users, and reduced on-line bills. That's because you can get what you want faster and get on- and off-line faster. Of course, employees might spend the day on AOL, but that's a people — not computer — problem.

How do you get all this to work? It's really pretty easy. First, get the TCP/IP software running on the workstation. If you need a freebie, Microsoft offers the Win32 stack for Windows and Windows for Workgroups clients free. You can download it from Microsoft's forum on CompuServe, from its Web site at <http://www.microsoft.com>, or via File Transfer Protocol, Windows 95 and NT include TCP/IP support.

Once you've got that up, download CompuServe 2.0 at <http://www.compuserve.com> and run the Install program. When prompted for TCP/IP support (they call it WinSock), make sure to check the box that says you're using someone else's WinSock. (Do not use the CompuServe provided product.) Then, complete the installation as usual. Selecting this option enables WinCIM to see your TCP/IP stack and hop on for the ride.

Connecting to the Internet under AOL is even easier. Using AOL's Version 2.5 or higher, go into Setup, and select the New Location option. (I name it TCP.) Then click on Network and scroll down until you see

TCP/IP, and select it. It's as simple as that! I've done lots of testing and haven't found a failure point yet. Users are pleased as punch.

What's amazing is that by using this process, you can control access times (such as shutting down peak times in the morning), generate traffic reports for management, use your Internet link better, and offer users the best access speed they've ever seen. Another

benefit is concurrent access to AOL and CompuServe for news junkies.

Best of all, you can reduce operating expenses by eliminating unnecessary modems, modem pools, phone lines (which can represent very expensive real estate in a telephone switch), and telephone charges, especially in cities that have per-minute message unit charges for local

telephone calls.

So now you've got something that's a win-win for everyone!



Paul Merenbloom is vice president, technology research at

Piper Jaffray, in Minneapolis. Send comments to him at plmeren@mcimail.com.

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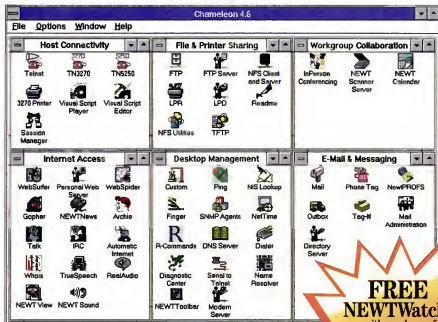
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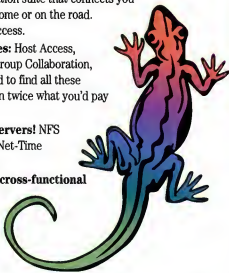
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Access information anywhere with Chameleon Desktop. If you need access to Unix systems, mainframes, minicomputers, PC-based LANs and WANs, and even the Internet, Chameleon Desktop is the comprehensive solution that will take you there. Chameleon Desktop is a client and server TCP/IP Windows application suite that connects you to the office network – at work, telecommuting from home or on the road. And with Chameleon you also get complete Internet access.

Chameleon Desktop includes six integrated suites: Host Access, File and Printer Sharing, E-Mail and Messaging, Workgroup Collaboration, Internet Access, and Desktop Management. If you tried to find all these capabilities individually, you'd end up paying more than twice what you'd pay for Chameleon.

Chameleon Desktop also includes six powerful servers! NFS Server, FTP Server, Web Server, Directory Server, PC Net-Time Server, and Domain Name Server.

Chameleon Desktop applications offer powerful cross-functional integration – drag-and-drop any information on the network between applications at the click of a button. Chameleon Desktop includes WinSock TCP/IP and is 100% DLL/VxD. Chameleon requires only 6KB memory and sets up in five minutes.



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Miami-based SetNet Inc. is shipping SetNet Mail, a LAN-based E-mail system built on standard Internet protocols, eliminating the need for gateways. The product creates multiple mailboxes for users at a site using a single dial-up Internet access account. A five-user package costs \$695. (800) 893-5865; <http://www.setnet.com>.

ANNOUNCED

ATT CORP. last week announced that AT&T WorldNet Service customers who order the service on the AT&T Universal Card will receive financial liability protection for purchases made over the Internet. The protection covers fraudulent transactions by unauthorized users over WorldNet's Internet service. (800) 423-4343; <http://www.att.com/worldnet>.

GE INFORMATION SERVICES INC. last week announced a new electronic commerce offering that provides security for business transactions over the Internet. GE InterBusiness combines encrypted dynamic session-key, mutual authentication, and advanced firewall technology, establishing a secure pipeline for users to conduct electronic data interchange using standard Internet protocols. (301) 294-1978; <http://www.geis.com>.

MICROTOUCH SYSTEMS INC. last week announced it has licensed Spyllglass Inc.'s Spyllglass Mosaic World Wide Web browser for use with the company's touchscreen hardware. The first product based on the licensed browser will be available in March. (508) 0659-9000; <http://www.microtouch.com>.

NETSCAPE COMMUNICATIONS CORP. and **INFORMIX SOFTWARE INC.** last week announced that Informix will integrate Netscape's software, including browser, server, and tools products, into Informix's database and tools products. <http://www.informix.com>.

Caldera readies Linux-based Internet OS

■ Caldera Network Desktop undercuts Solaris, UnixWare, Windows NT

By Jason Pontin

AFTER MORE THAN a year and a half of development and testing, Caldera Inc. this week at Uniform in San Francisco will release the Caldera Network Desktop, a Linux-based operating system designed to provide users with a complete range of Internet services.

Caldera, a start-up based in Orem, Utah, and funded by former Novell Inc. chairman Ray Noorda, is bundling Linux — the freeware Unix clone for Intel Corp. platforms — with an X Windows GUI, Network connectivity, and the complete range of Internet protocols to give corporations an economical alternative to platforms such as SunSoft Inc.'s Solaris, The Santa Cruz Operation Inc.'s OpenServer and UnixWare, and Microsoft Corp.'s Windows NT.

The Caldera Network Desktop (CND) costs \$99, according to Bryan Sparks, Caldera's president.

By contrast, SCO OpenServer and SCO UnixWare cost \$1,295, Solaris costs \$1,995, and NT costs \$699.

For some users, the low cost made the Linux OS a compelling choice.

"With the development tools we'd need, SCO would have cost us more than \$2,000 a system," said Kerry Schwab, Unix systems administrator for Southwest Airlines, located in Dallas.

And, Sparks said, CND has more Internet features than UnixWare or Solaris. CND lets users access all the Internet's services, including the World Wide Web, File Transfer Protocol, Wide Area Information Server, and Gopher.

CND also includes a multi-domain Hypertext Transfer Protocol (HTTP) Web server, Simple Mail Transfer Protocol, E-mail, dial-in access via Point to Point Protocol and SLIP, support for the Network News Transport Protocol, and IPX and TCP/IP routing.

CND is also a NetWare client, with NetWare Directory Services, a Windows for Workgroups client and server, and, through the Network File System, a Unix client and server.

Sun Solaris, in contrast, does not come bundled with a multi-domain Web HTTP Server, IPX routing, or NetWare or Windows client and server software.

And until SCO ships Atlas and Microsoft delivers a forthcoming version of NT, Caldera should also have a leg up on these rivals. (See "SCO to build Internet tools into its OSes," Feb 5, page 1.)

This week Caldera will also release a suite of native Linux applications — called the Caldera Internet Office Suite — that includes



THE CALDERA NETWORK DESKTOP interface lets users access the Internet from their desktops.

WordPerfect with Hypertext Markup Language authoring, NCD Software Corp.'s Z-Mail E-mail package, Xess Software Corp.'s Nexc Spreadsheet, and Metrolink's Executive Motif Libraries.

For the next 60 days, Caldera users can buy the Caldera Internet Office Suite for \$250. After the promotion, the suite will cost \$329.

Caldera is at (800) 850-7779.

Banyan to ship 'net directory, Web-savvy E-mail client

By Jessica Davis

and Nick Wingfield

BANYAN SYSTEMS INC. next week will announce a new intelligent E-mail client that uses agents to automatically browse the World Wide Web and retrieve selected pages in native Hypertext Markup Language format.

The company's newly formed Internet division, Coordinate.com, will also next week launch Switchboard, a Web-based directory service for locating individual and

phone numbers, addresses, and, in some cases, E-mail addresses.

"Banyan is using the mailbox as a way to get into the Web," said Michael Sullivan-Trainer, an analyst at International Data Corp., in Framingham, Mass. "Mail is a two-way medium. Browser technology is still a one-way medium."

The product also includes WebMinders, a feature for automatically retrieving Web pages during off-peak times when systems are less likely to be busy. The WebMinders agent is Banyan's second agent.

BeyondMail technology also offers MailMinders agents that sort and filter incoming mail into pre-defined folders.

BeyondMail: Personal Internet Edition, in beta testing and expected to ship in March, will cost \$29.

The product is the second client Banyan has released that natively supports Internet protocols, eliminating the need for Internet gateways. BeyondMail Professional Internet Edition, the first product launched by the company's Internet division, shipped in December.

Leaping into the growing category of Internet directory services, Switchboard, based on Banyan's ServerTalk, will provide more than 104 million listings, including

phone numbers, addresses, and, in some cases, E-mail addresses.

Unlike other directory services that list E-mail addresses, such as Four11 Corp.'s Four11 site, Switch-

board will let users send E-mail through the Switchboard site without knowing a user's address.

Coordinate.com hopes to provide a greater degree of privacy with this feature, officials said.

Banyan, in Waltham, Mass., can be reached at (508) 898-1000 or at <http://www.banyan.com>.

THE WEB HOTLIST

Web sites worth checking out

- SMC** <http://www.smc.com>
Standard Microsystems Corp. showcases its family of LAN system products. Read the white paper *Fast Ethernet Technology: Evolution and Migration* or visit the Technical Support area to download the latest adapter drivers.
- FutureTense** <http://www.futuretense.com>
Concord, Mass.-based FutureTense Inc. focuses on tools for the delivery of electronic content in an interactive, graphically rich environment. Learn about Texture, a Java-enabled World Wide Web authoring system.
- Freelader** <http://www.freelader.net>
Internet start-up Freelader Inc. offers software that allows users to automate logging on to the Internet and downloading Web pages for off-line viewing. The Freelader software and service are free.
- Voxware** <http://www.voxware.com/index.html>
Voxware Inc. features information on its digital speech-processing line of products. Download ToolVox for the Web, a Netscape Navigator 2.0 plug-in that enables audio content to be included in Web pages.
- CyberAtlas** <http://www.cyberatlas.com>
Interstellat, a San Francisco-based management consulting company, presents CyberAtlas, a compendium of Internet-related facts and statistics. Link to surveys, demographic data, and information on Web software tools and resources.

Send URL suggestions to james_batthey@infoworld.com

CompuServe plugs in to Internet access

■ On-line services reinventing themselves as Web-based service providers

By Nick Wingfield

COMPUSEVERE ON-LINE services are racing to embrace the Internet by offering aggressively priced Internet-only access services.

CompuServe Internet Division last week announced the availability of Sprynet, formerly code-named Spryte.

Another proprietary on-line service, Prodigy Services Co., in early February announced plans to offer dial-up Internet-only access for \$1 an hour.

The new Internet services are an admission by two pillars of the proprietary on-line service industry of the massive shift in consumer interest toward the Internet, said one analyst.

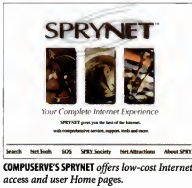
"Symbolically, [Prodigy and CompuServe] recognize that the entire [proprietary] on-line model will fail," said Daniel Briere, president of Telechoice Inc., a telecom-

munications consultancy based in Verona, N.J. "They're trying to keep their foot in the door till they come up with an alternative strategy."

With pricing from on-line services, telephone companies, and smaller Internet service providers becoming more aggressive, dial-up Internet access may soon be free, supported by advertising revenues, Briere speculated.

Sprynet, partial pricing for which was announced in October, will include a \$19.95 unlimited-hours pricing plan. Unlike most Internet service providers, CompuServe will not require a start-up fee.

Users can also sign up for a \$4.95-per-month pricing plan that



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COMPUSEVERE'S SPRYNET offers low-cost Internet access and user Home pages.

includes 3 hours of connect time or \$9.95 for 7 hours, with \$1.95 charged for each additional hour.

Subscribers to Sprynet will receive 24-hour-a-day customer service, software, and a free Home page on the World Wide Web.

CompuServe claims to be the world's largest Internet service

provider through its global Internet backbone, which includes 187 points of presence from 147 different countries. The company has offered World Wide Web access as a feature of CIS, its proprietary on-line service, since April of last year.

Prodigy will begin market trials on its low-cost Internet access services on March 19 in the New York metropolitan area. The company will not require monthly minimum fees during the trial but might require them when the service goes into commercial release. National availability and more detailed pricing for the service have not yet been announced.

More information about CompuServe's Sprynet service is available at (800) 777-9638 or <http://www.sprynet.com>. Prodigy can be reached at (914) 448-8000 or <http://home.prodigy.net>.

E-mail

Internet-native E-Mail gains on proprietary messaging

By Jessica Davis

IF IT INCLUDES some new way to connect to the Internet, it will sell.

That seems to have become the mantra of messaging vendors, who, during the past 12 months, have added Internet connectivity to their existing proprietary E-mail product lines or introduced new E-mail systems sporting new Internet protocols, eliminating the need for Internet gateways.

Banyan Systems Inc. will introduce next week its second Internet-native mail client, and SetNet Inc., a start-up based in Miami, launched its namesake Internet-native E-mail system late last month at Demo '96.

Meanwhile, Software.com Inc. brought out its server-based World Wide Web E-mail system last fall, and Netscape Communications Corp. licensed the system for its line of Internet products.

The Internet support is being driven by customers looking to link LANs over an Internet backbone.

For example, many customers are looking at Post Office Protocol 3 (POP3) servers as an alternative to more robust proprietary products, such as Microsoft Corp.'s Exchange, Lotus Development Corp.'s Notes

4.0, and Novell Inc.'s GroupWise, says Joyce Graft, an analyst at Gartner Group Inc., in Stamford, Conn.

"POP3 servers are Tinkertoy compared with Notes and Exchange," Graft says. "That would be a huge step back in functionality. But these users are betting there will be more functionality going forward. It's an interesting wager."

Eric Arnun, editor of Electronic Mail and Messaging Systems, says many proprietary messaging systems, such as Notes, Exchange, and GroupWise, are lowering rather than raising the bar on functionality when they include more Internet connectivity.

"You lose a lot of functionality when you use a Web client to access a mailbox," Arnun says. "In terms of messaging, it's an extremely poor interface."

Still, Lotus, Microsoft, and Novell need to offer access to user mail boxes via World Wide Web browsers.

"Today, the people who use the Internet and E-mail in general far outweigh the number of people who use the Web," says Michael Sullivan-Trainor, an analyst at International Data Corp., in Framingham, Mass. "All our forecasts point to that changing."

Black Sun offers CyberGate browser for 3-D Web surfing

By Nick Wingfield

HOPING TO LET users get their virtual hands on Internet information, pioneering software companies are releasing products for building and navigating on-line 3-D environments.

The latest product comes from Black Sun Interactive Inc., which will this week post on the Internet CyberGate, a free Windows 95 and Windows NT browser for navigating Virtual Reality Modeling Language (VRML) sites.

CyberGate includes multilayer chat capabilities so that avatars representing users can interact in a three-dimensional space.

But CyberGate and other products in this category employ extensions to the VRML standard for multilayer and animation capabilities, so they are not interoperable.

In general, standards work in this area is proceeding in a piecemeal fashion.

Microsoft Corp. last December announced it was submitting its Active VRML specification, which includes animation components, to standards bodies. Apple Computer Inc. last week posted its own specifications for a refined VRML standard, which improves 3-D image quality on its Home page.

Besides its browser, Black Sun will

ship by this summer CyberTab, a server for hosting 3-D sites, and CyberKit, a software development toolkit for creating 3-D worlds. Pricing for both products has not been announced.

Although intriguing, VRML technology is far from becoming a common offering on most World Wide Web sites, analysts said.

"[Vendors] haven't sold corporations on [VRML's] use," said Stan Lepeak, an analyst at Meta Group Inc., in Stamford, Conn. "The idea that people need these environments to get to information is a little far-fetched."

But, according to one company that is hosting a 3-D site, virtual environments will be important.

"CyberGate will provide a new navigation metaphor for browsing," said Bob Davis, CEO of Lycos Inc., in Marlboro, Mass. "It's a new frontier for Web guide offerings."

Initially, Black Sun's browser will work as a stand-alone product or as a helper application for browsers. Black Sun plans to offer its viewer as a plug-in for Netscape Communications Corp.'s Navigator 2.0 and as an OLE custom control for Microsoft's Internet Explorer 3.0.

Black Sun, in San Francisco, can be reached at (415) 263-6836 or <http://www.blacksun.com>.

NEC PC PACKAGE EASES FIREWALL MAINTENANCE

By Nick Wingfield

STRIVING TO SIMPLIFY maintenance of corporate fire walls, NEC Technologies Inc. last week began shipping a Pentium-based PC package with a CD-ROM that contains a modified version of BSDI Unix and NEC's firewall software.

Designed to facilitate upgrades as they become available, PrivateNet relies on a CD-ROM to boost the security of the network because the fire wall software and operating system reside in read-only storage, the company said.

Having software on CD-ROM is attractive to systems administrators, users said.

"You restore the integrity of the system as soon as you reboot. If your system is compromised, the CD-ROM always contains a clean copy," said Christine Hogan, a computer and network security officer at Synopsys Inc., a maker of electronic design automation tools based in Mountain View, Calif. "Maintenance is easier. You just slap the new CD-ROM [with software updates] in and there's no down time."

However, analysts cautioned that the fire wall will still be vulnerable to attacks when active because it is loaded into memory.

"[The CD-ROM] would theoretically prevent a virus," said Chris Byrnes, an analyst at the Meta Group Inc., in Reston, Va. "But it would only prevent it from infecting the firewall system recurrently, in a permanent manner."

PrivateNet, which is priced at \$14,950, comes with applications-specific proxy servers for handling all incoming traffic to a network. Proxies included in the product are for Telnet, Network News Transport Protocol, Simple Mail Transport Protocol, and Hypertext Transfer Protocol.

For outgoing traffic, NEC has created a commercial implementation of Socks called SocksPlus.

Socks is a generic proxy service that enables outgoing communications through the fire wall for all applications.

PrivateNet also includes encryption capabilities for forming virtual private networks over the Internet.

NEC, located in Mountain View, Calif., can be contacted at (408) 433-1226 and on its Home page on the World Wide Web at <http://www.private.net>.

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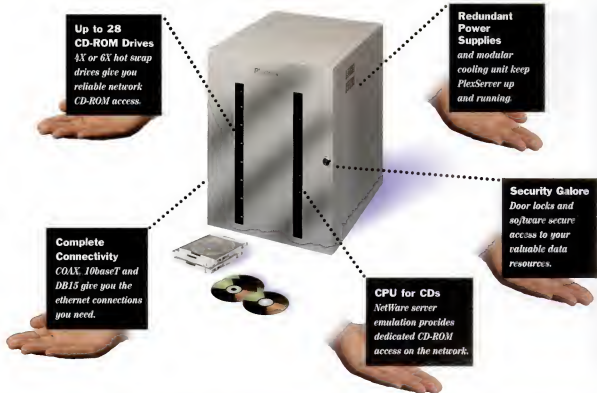
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S U P P L Y I N G T H E D E M A N D I N G

FROM THE ETHER • BOB METCALFE

Network computing hits clipboards and Wintel still has a PC mind-set

THE DEBATE continues over "thin client" Internet computers — Larry Ellison's \$500 Java terminal, in particular. PCs are retrofitted awkwardly when they happen to need networking, which is almost always these days. Should PCs be joined in the market by computers designed as if the Internet were here to stay?

The aging Wintel platform has served us well over its 15 years of evolution. Should it continue to expand its domination of microprocessor markets?

Let me again remind those who are certain that the Wintel PC will dominate forever, at least into the next millennium, that we're not just debating long-term trends here. The increasingly vast majority of microprocessors are *already* vast Pentiums and are *already* going into computers untouched by Windows.

Anyway, this week, to continue on the point that network-centric computers will come in many forms, I want to tell you about what I call a "clipboard computer" from Zenith Data

Systems Corp., in Buffalo Grove, Ill. Zenith last month announced and is now shipping a new multitier client/server network system incorporating a thin client that they call a folio-size wireless personal access device for locally mobile workers.

To prove just how open-minded I am about the possibilities for \$500 non-Wintel Internet computers, Zenith's MultiCruise network sys-

tem costs much more than \$500, runs Windows NT applications on a Pentium server, and is on a high-speed wireless LAN that, well, does not have to be on the Internet.

If you believe that owning a fully stand-alone PC is your right as protected by the Constitution, then you're not going to like MultiCruise.

The clipboard computers in MultiCruise are called CruisePads. You can hold a 3-pound, 9.8-inch-by-10.6-inch CruisePad in one hand, like a clipboard. It has a touch-sensitive 8.5-inch backlit 640-by-480 display on which you can point and click with a finger or a pen using your other hand. The

CruisePad is fully wireless, with a battery that lasts 2 to 5 hours. I suppose you could find out what kind of processor the CruisePad has inside, but Zenith says it's not important, so you can be sure the CruisePad is Pentiumless. A CruisePad would list for \$1,399, but Zenith doesn't sell CruisePads by themselves, only in multitier systems going for \$2,000 to \$3,000 per user — servers, software, and all.

Remember that PCs took over from minicomputers when the costs of processors came down far enough so everyone could have his or her own. Internet computers will be taking over from PCs now that the costs of networking are coming down — most computers (examples: video game players and Java terminals) need not be nearly so reconfigurable, self-sufficient, expensive, nor so difficult to use anymore.

The CruisePad is only possible because of CruiseLAN, a spread-spectrum, frequency-hopping radio LAN that operates over 15 channels near 2.4 gigahertz at 1.6Mbps in links from 300 to 1,000 feet depending on building configuration. The radio LAN hops around radio interference and is secure. Hundreds of CruisePads can share a cell. The radio hub for each cell lists for \$1,899.

They are placed in a building after a site survey conducted by a trained Zenith reseller —

don't try this at home. Ethernet is used to connect the cells so that CruisePads may roam and be handed off from one hub to the next.

In the new MultiCruise system, each CruisePad connects via CruiseLAN and Ethernet to a network server. The MultiCruise server is an extended version of Windows NT

running a virtual machine for each CruisePad. Each CruisePad can run any Windows application, including World Wide Web browsers and their Java applets.

Zenith developed CruisePad, CruiseLAN, and MultiCruise for the tens of millions of people who today are likely to be carrying clipboards — locally mobile workers in health care, vehicle service, retail, and manufacturing.

Zenith cites recent BIS Strategic Decisions Inc. research that indicates 69 percent of white-collar mobility is local — 55 percent away from desk but within building, 14 percent out of building but on campus, and the rest beyond.

Learn more about Zenith's MultiCruise system at <http://www.zds.com> or by calling (800) 533-0331.

Bob Metcalfe invented Ethernet in 1973 and founded 3Com Corp. in 1979. He receives E-mail at bob_metcalfe@infoworld.com via the Internet.



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Passing the bloatware buck: Programmers finger deadlines, driven bosses

I'm still not sure whether there are many programmers out there who are too lazy to write good code, but I now know for certain there are plenty with the time and energy to write interesting E-mail. My recent column about bloatware (see "Faster hardware is just a Band-Aid solution for bloated software pigs," Jan. 15, page 52) engendered quite a bit of response, particularly from programmers commenting on the suggestion that part of the bloatware problem is due to their colleagues' failure to write tight code.

Not surprisingly, several were upset at my casting aspersions on their profession. "Lazy programmers!" wrote one. "How about overworked, underappreciated programmers doing their best to meet unrealistic deadlines by executives driven to be first to market with the latest gadgetry?"

What was surprising, however, was that even more programmers agreed that programming has gotten worse. "It is not so distant a memory that software with bugs would be pulled from shelves and the manufacturer would be shamed for life," wrote one reader. "Now it is accepted practice you don't buy Version 1.0 of anything. Instead, you wait for 1.1 or 1.2 so they can get at least the major glitches out."

That reader doesn't blame the programmers, though. "The advertising and marketing folks have pumped client/server, GUI, and the like at us so much that now an application is in the Dark Ages if it doesn't do everything," he wrote. "The old mainframe folks still build the best systems — they had to create applications that fit the business need, not some perceived notion of 'modern.' Now, unless it automatically installs, faxes, E-mails, auto-saves to disk, feeds the dog, and satisfies our spouse at night, it is old-fashioned and needs to be updated."

Many readers pointed out that today's applications require more code to support the GUI environment. "We programmers like faster software as much as anybody," wrote one. "But it takes more code to do the stuff that everyone has hoped for the last few years — multimedia, messaging, plug and play, directory services, and so on."

Programmers blamed impossible deadlines and managers' unrealistic expectations. "Product managers usually aren't programmers themselves, and they have no clue what can be expected," wrote one programmer at a software company. "What's worse, they don't care. Delivering a quality product isn't as important as starting up the revenue stream as soon as possible."

Another programmer mentioned Mark Twain's famous apology for not having the time to write his letter shorter.

"As a programmer, I have often felt the same way. Today's software development cycle does not allow time to optimize and refine products, and that leads to bloatware. A software developer has barely enough time to develop and test the functionality of a product before the marketing department puts shrink-wrap on the box. New products and new versions of old products generate revenue; making old programs work faster and use less memory does not generate revenue, and consumers won't pay extra for an improved release that offers no functionality."

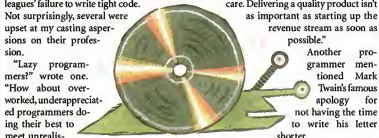
It's not just incompetent managers — the marketplace doesn't reward good programming practices.

"Let's say I decide to become a software developer/publisher," wrote another reader. "I buy MASM or TASM and a ton of well-optimized Windows routines. I tell my developers to carefully craft their own routines for optimized speed. My project only costs three times as much as the guy that bought some libraries, because I have the best developers in the field. I go to market, but after he goes to market. The market pays a premium of zero dollars for my speedy product."

The result, this reader says, is that software companies can't win with quality programming.

"Quickly done programming drives out the excellent," he wrote.

Ed Foster's Gripe Line examines issues of product quality, customer service, and sales practices. Readers can send gripes to ed@infoworld.com or call (800) 227-8365, ext. 710. You can participate in InfoWorld Electric's Gripe Line forum at <http://www.infoworld.com>.



TO THE EDITOR

Bob Lewis was a man on a mission when he wrote a column about mission statements a couple of weeks ago. Lewis advised readers to concentrate more on the content of a statement than on the form. He also suggested that managers conduct staff discussions of statements on a regular basis to keep business units on track. Then readers wrote in to tell us about their own experiences with mission statements. Meanwhile, another reader is watching the competition between Microsoft and Netscape.

IS should be on a mission

WHEN I WAS HIRED to build an IS department for my current employer, one of the first things I developed was a department mission. (See IS Survival Guide, Jan. 29, page 99.) It's imperative to have a guiding statement of your purpose, especially since IS departments are often heavily self-managed and can easily lose sight of their customer responsibilities. Additionally, people in your organization eventually start asking things of the IS department that really don't have anything to do with IS. The mission statement provides an excellent reality check for those times.

Our mission is actually two brief statements, since (in my case) there are really two purposes served by IS.

1. To proactively seek solutions for improving the functionality and performance of NewMedia's computing environment.
 2. To help end-users find new ways to best utilize the available computing resources.
- I find that these guiding statements do an excellent job of keeping things focused. All activities are covered — upgrading the network infrastructure with switched Ethernet or 100Base-T, moving the database to a client/server architecture, teaching users how to perform LAN-based faxing, and so on.

Scott Kahn
NewMedia magazine
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I enjoyed reading Bob Lewis' column on mission statements. He writes, "I hold discussions about your mission and vision frequently with the whole management team to make sure your direction still makes sense as circumstances change." I am not sure you

QUICK POLL

Your ISP: asset or pain?

Internet service providers (ISPs) have sprung up like mushrooms in the past two years, providing service and bandwidth that range from excellent to poor. Are you satisfied with your ISP?

Call (800) 713-INFO to register your opinion.

Re: Third-party support

In our Jan. 29 issue (page 97) we launched our Quick Poll: Do you plan to purchase third-party support services in 1996? Forty of you responded, with 17 votes yes and 23 votes no. (Percentages have been rounded off.)



have touched on the concept of "buy in," either at the formation of the mission and vision statements or in the review of their currency to the ever-changing organization.

I believe that a large cross-section of the entire organization, some management, but not exclusively, must have bought in to the mission in ways that permit easier communication and acceptance throughout the enterprise. If you build a coalition ahead of time, the end product is better, and those who need to internalize it for the organization to succeed are already there.

Gary Waits
Houston
ghwaits@rsoc.rockwell.com

Just a few more words about OS/2

NICHOLAS PETRELEY MAKES a few interesting observations in his Down to the Wire awards regarding OS/2. (See Jan. 29, page 121.) No, IBM doesn't have a strategy for its product. The company's ineptitude in marketing the product as an useful mainstream business applications to use with it just dumbfounded me. Yes, the press has incorrectly predicted OS/2's demise too many times despite the fact that it is outselling Windows NT.

One of the big IS research firms recently

IT'S IMPERATIVE TO HAVE A STATEMENT OF YOUR PURPOSE, SINCE IS DEPARTMENTS ARE OFTEN HEAVILY SELF-MANAGED AND CAN EASILY LOSE SIGHT OF THEIR CUSTOMER RESPONSIBILITIES.

Scott Kahn
San Mateo, Calif.

noted that OS/2 LAN Server outsold NT Server two to one last year. Petreley should have added that increasing numbers of catalog retailers are devoting more and more space to OS/2 applications.

I agree that Petreley could become a pariah among his colleagues in the IS press, and probably be tarred and feathered to boot, if he continues to talk about OS/2 in a positive light.

If Petreley's opinions mirror those of InfoWorld's editors, then perhaps they could see their way to more balanced editorial coverage of a fine, if poorly marketed, product. Readers need to know that they have credible alternatives to Windows NT and Windows 95.

IF LAN Server really is outselling NT server, then there ought to be no shortage of success stories that InfoWorld could put in the front of the magazine instead of on page 121.

Jack Ellis
Los Angeles
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"PRODUCT MOST LIKELY to be discontinued: IBM will abandon OS/2 Warp several

more times this year. Well, to be honest, that probably won't happen. But it's the national pastime of the trade press to predict OS/2's demise, and I understand I could lose my Clark Kent press hat if I don't cooperate."

Actually, I think Petreley is already at risk by not praising Java in this week's column.

Don Hawkinson
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dhawh@southwind.net

Why no System 7.5 in Best of '95?

I WAS SURPRISED to not see Macintosh System 7.5 even mentioned in the explanation of why there is no decisive winner in the desktop operating system category. (See The Best of 1995, Jan. 29, page 62.) The article spoke of the shortcomings of Windows NT, OS/2 Warp, and Windows 95, most of which are not problems in the Macintosh world. System 7.5 has stability, good networking, and an easy-to-use interface that is still the measuring stick by which other operating systems are measured.

Doug Smith
Loves Park, Ill.
doug@sga.org

Cheers for an ex-cell-ent column

I WANT to commend Stewart Alsop on an excellent article regarding the cellular phone. (See Distributed Thinking, Jan. 22, page 98.) InfoWorld is about devoid of information that enables us to make wise technological decisions. This information need not be — and in many instances our decisions are not — limited to the desktop PC.

Drew Krum
Los Angeles

May the best product win

STEWART ALSOP SCOOPED the entire industry on this one. Tremendous! (See Distributed Thinking, Jan. 15, page 98.)

The people at Netscape don't realize what they're in for. I clearly remember a Marc Andreessen interview from a few months back where Marc blasted Bill Gates' failed vision of the future.

I wonder what Marc has to say today? Can you imagine the conversations taking place at Netscape headquarters?

I'm thinking Marc Andreessen has seriously underestimated the genius of his adversary Bill Gates.

The world desperately needs people like Marc Andreessen and Bill Gates, and, fortunately for us, they do exist and are magnetically attracted to our free market system. Let the competition begin, and may the best product win.

I'm excited. How do I declare my faith in the World Wide Web religion? And does that Kool Aid come in some color other than red? There are too many red boxes around here from Provo, Utah. Count me in.

John Pingle
jpingema@co.san-diego.ca.us

FROM THE EDITOR IN CHIEF · SANDY REED

Mrs. Malaprop meets her match: Technopropisms are the new bungled words

A malapropism is an unintentional but ludicrous use of a word somewhat similar to the correct word, such as "Remember Pearl Island." The name comes from Mrs. Malaprop, who was prone to saying such phrases. Malapropism is a great word but doesn't quite work to describe what can happen when

language and the tools of technology collide when using, for instance, spelling checkers. For that, I propose a new word: technopropism.

A technopropism is a word that is correctly spelled but improperly used. It occurs in sentences such as: "No one expect the developer excepted that the program would sell a million copies," when it should have read, "No one except the developer expected..." Or, as we recently reported in *InfoWorld*, a company planned to be "first out of the shoot" with a product. Except we meant "first out of the chute."

Manuals and World Wide Web sites are fertile ground for technopropisms. If you see any, feel free to forward them to me. I'll add them to the *InfoWorld* collection.

On another language front, I was pleasantly surprised at how many readers took the time to point out what seemed to be a mistake compounded when I wrote about the posses-

sive form of the name of cartoonist Scott Adams (See "Errata, erratum, er...rats!" The language gods and I have failed each other," Jan. 15, page 53). Lots of you cited authorities who say the correct form is Adams's.

That's true in many magazines, but most newspapers, including *InfoWorld*, follow a core set of grammatical guidelines established by the Associated Press. And AP says adding an apostrophe (no extra s) to singular proper names ending in s, as in Adams', is correct.

That same column also discussed the confusion over forming the plurals of words with Latin roots. One example, from reader Tom Ledford, cited "cafeteria" as an example.

As several grammarians noted, though, cafeteria has its origins in Spanish, not Latin.

Sandy Reed is editor in chief of InfoWorld. Send your comments or technopropisms to sandy_reed@infoworld.com.

13 YEARS AGO IN INFOWORLD

CP/M came out swinging at the beginning of the end

FEB. 14, 1983 Executives from Digital Research Inc. (DRI) were desperate. With MS-DOS edging CP/M out of the exploding IBM PC market, the company slashed the price of CP/M-86 for the IBM PC by 70 percent and

added new features to the 16-bit version of the operating system. *InfoWorld* covered these announcements in a Page One story that began with the line: "It was the biggest day ever for CP/M." Announcements also included CP/M-68K, Z8000-CP/M, and DR Logo.

"Our goal is PC penetration," said John Rowley, then president of DRI.

The announcements were made at CP/M '83 — a show devoted to the venerable operating system. It drew 48,000 attendees even as

CP/M was, well, slowly turning to toast. The show was started by DRI's then-chairman Gary Kildall and Boston Computer Society founder Jonathan Rotenberg.

At the show, Rowley said he believed DRI could persuade 20 percent of IBM's users to adopt CP/M in a year. Our story noted: "Rowley cites the acceptance of CP/M cards by users of the Apple II."

Well, you don't have to be born much before 1963 to know that DRI's effort to reignite interest in its product failed. Although products for CP/M trickled out for a few years more, 1983 was the beginning of the end for the personal computer industry's first widely adopted operating system. A new era, one we've come to know well, had begun.



G. KILDALL



J. ROTENBERG



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CHOOSING A Remote-access strategy

By Mel Beckman

There was a time when enterprise network administrators could ignore users who clamored for remote access to the company LAN. Expense, security, and the loss of direct control were frequently cited as reasons for keeping the corporate network sacrosanct. But with affordable internetworking technologies, encryption breakthroughs, and sophisticated management software, those days are gone.

Remote access can pay for itself in savings from improved productivity and office space reductions, but only if you choose an efficient access strategy and consider hidden costs. Some solutions are easier to deploy and support than others. And some remote-access strategies, including using the Internet as an inter-LAN pathway, raise serious security and reliability issues. (See story, page 62.) To roll out a successful remote-access solution, you

need to understand the components of remote access, how protocols affect those components, and the cost of various approaches.

Telecommuting, in particular, drives many an enterprise to remote access. Sales staff at Richardson Electronics Ltd., an electronics component distributor in LaFox, Ill., can work out of home offices over ISDN lines to place orders and check inventory. Richardson systems engineers use a 56Kbps frame relay link to access the corporate LAN from remote development sites; executives have home ISDN access for after-hours work.

"We have 15 ISDN sites, 20 frame relay sites, and 24 800-number dial-in modem ports for mobile users," says Mark Wolf, Richardson's communications manager. "We replaced our private point-to-point modem network with Ascend remote-access gear and saved thousands of dollars a year just in dial-up costs."

THREE EASY PIECES. There are three components to a remote-access LAN implementation: a central-site access server, one or more remote-site access devices, and a WAN

link between central and remote sites. The choices you make for these components depend on the type and number of users you serve and whether you're connecting individual users or entire LANs.

The determining factor for a central-site server is the number of simultaneous remote connections you must accommodate. The server for a single remote user might be as simple as a PC with an attached modem. Beyond one or two connections, throughput and reliability issues make dedicated, proprietary servers a more attractive option.

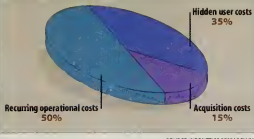
Bellevue, Wash.-based Attachmate Corp.'s Remote LAN Node (RLN) Access Server is an example: a pre-installed, preconfigured Pentium-class PC with Ethernet or Token Ring LAN connections, Attachmate's RLN server software, and hardware for as many as 32 ports. RLN, however, supports only one remote user, or node, per connection. If you need to support entire LANs remotely, you must turn to remote LAN bridge and router solutions, such as Pipeline Max from Ascend Communications Inc., in Alameda, Calif., which can support more than 100 simultane-



Supporting remote users can save money, but only with the right hardware, software, and connection

Hidden user costs cause remote-access price tag to jump

A September 1995 study found that installation, configuration, and troubleshooting can eat up 35 percent of all remote-access costs



ous remote LAN connections.

Remote-site devices are usually simpler and less expensive than a central-site server. Here, the determining factor is the kind of user you're serving. A single user with light-duty access might get by with a modem or ISDN terminal adapter connected to a PC serial port. For heavy-duty telecommuting or for branch offices where a small remote LAN must access the central network, you should consider a stand-alone remote-access router.

These come in all shapes and sizes. At the low end is the Ascend Pipeline 25 ISDN bridge and router, which incorporates two analog ports for simultaneous data access and fax, modem, and voice operation over a single ISDN line.

If you can't be married to a particular WAN technology, buy a router with external communications gear, such as Alameda-based Tribe Computer Works Inc.'s TribeLink 2, a midrange 2-port remote-access router that can also do duty as a small central-site server.

For the ultimate in flexibility, San Mateo, Calif.-based Skyline Technology Inc.'s Velloce bridge/router sports a built-in ISDN interface and a high-speed serial port to which you can connect everything from a 28.8Kbps modem to a 1.544Mbps CSU/DSU (channel service unit/data service unit) for a T1 frame relay link.

STAND BY YOUR WAN. Your operating budget and service availability will determine the choice of WAN link. There are only a few options here: modem, ISDN, Switched 56, and frame relay. Because you pay for the WAN link every month, it eventually will be one of your largest remote-access costs.

For telecommuting and branch-office access, ISDN is a current favorite.

"ISDN is the only reasonable [choice] for remote access today," says Bob Berger, co-founder of InterNet Information Services Inc., an all-ISDN Internet and telecommuting access provider based in San Francisco. "Modems are too slow and too unreliable. ISDN is four times faster and, once installed, works flawlessly every time."

With monthly ISDN charges ranging in California from a low of \$25 to a high of about \$75, plus usage costs of a penny or two per minute for local calls, ISDN lets you get into high-speed digital links cheaply: the nearest competitor, Switched 56, costs twice as much

for half the bandwidth.

At Richardson Electronics, ISDN has helped lower remote-access costs.

"We had telecommuters before ISDN, but the monthly phone line fees added up: \$120 per month to get three lines, for voice, fax, and modem," Richardson's Wolf says. "Now we accomplish the same thing over one ISDN line for \$40 per month and get vastly improved response times."

Alas, ISDN availability varies widely. California's Pacific Bell reported 90 percent coverage by the end of 1995, with Bell South and Atlantic Bell coming in as distant seconds at about 75 percent coverage. Other Regional Bell Operating Companies, such as Southwestern Bell and US West, have even less coverage and higher prices. (For up-to-date information on ISDN availability and rates, consult Dan Kegel's ISDN World Wide Web page at <http://alumnic.netech.edu/~dank/isdn/>).

ISDN doesn't work for everyone, however. It is sometimes difficult to install and support, and many users report less-than-satisfactory up time. And unless you're lucky enough to have flat-rate ISDN access (no per-minute charges), costs can increase steeply with heavy usage. Particularly with branch offices, where several users share a single line, controlling costs can be difficult. An ISDN line nailed up for 10 hours per day, 20 days per month, at a penny per minute, costs only \$120 per month. But a line that must be up around the clock for night batch jobs or multiple shifts can easily double or triple that cost.

When line costs exceed a few hundred dollars per month, it's time to consider frame relay, a distance-insensitive digital transport that costs as little as \$100 per month per 56Kbps node in the same local frame relay

cloud. Each telephone company has its own frame relay cloud, usually covering an entire local access and transport area (LATA). Pacific Bell's LATA-5 cloud, for example, runs from San Diego to north of Bakersfield.

In addition to providing point-to-point connectivity, frame relay lets you interconnect multiple locations with only one physical link per site, a useful advantage if you're interconnecting several branch offices.

Be sure to research start-up costs before committing to frame relay. Up-front equipment costs can be two to three times that of ISDN for equivalent bandwidth, and line installation costs can be much higher.

OBSERVING PROTOCOL. Protocols dictate whether you use bridging or routing for remote access. Bridging accommodates virtually any protocol, because it moves traffic between nodes based on the physical Media Access Control (MAC) layer address in each packet. But it wastes bandwidth by moving unnecessary traffic.

For automatically dialing remote connections, bridging can result in high telephone bills by indiscriminately bringing remote nodes on-line. Bridging also presents a security problem:

Packet sniffers can remotely eavesdrop on central-site LAN traffic by impersonating MAC addresses. Routing solves those problems by explicitly controlling where packets go. TCP/IP, IPX, and AppleTalk are the most easily routed protocols. Other common protocols, such as Banyan Vines and DECnet, can only be bridged.

One protocol, TCP/IP, has become ubiquitous in the remote-access world. TCP/IP supports protocol tunneling, letting organizations move difficult-to-route protocols such as Systems Network Architecture through a TCP/IP connection.

Protocol support comes in many variations. In addition to routing and bridging, a remote-access server needs to deal with problems that arise when an access server makes remote devices appear to be locally attached. Many LAN

devices expect to be running over a high-speed local LAN and take advantage of the presumed bandwidth by conversing chattily among themselves. For example, a file server might periodically poll nodes that have mounted files, which could spur an access server to repeatedly dial up remote nodes.

Normally, an access server handles such routine but nonessential traffic through protocol "spoofing"—answering certain LAN queries on behalf of the remote node without actually bringing up the remote connection. But spoofing is not an exact science. Bob Larrabeau, of Larrabeau and Associates, a San Francisco-based ISDN integrator, tells of a client's "\$5,000 weekend."

"After [we installed] an ISDN link between a Canadian file server and a workstation in Arizona, the file server filled up," Larrabeau

says. "The server began buffering all users, including remote ones, of the out-of-space condition. Unfortunately, the Arizona workstation was powered off for the weekend, causing the access server to make a long-distance call every 30 seconds for 60 hours in an attempt to deliver this ... warning message."

The problem was a failure of the vendor's spoofing algorithm to accommodate the server's routine traffic. Take care, then, to ensure that vendors understand your protocol requirements, and carefully test protocol functionality.

BUYING INTO A STRATEGY. What does it all cost? A recent study by Infonetics Research Inc., in San Jose, Calif., found that on average, companies spend \$6,400 annually per remote-access user, with 35 percent of the cost going to hidden expenses: time spent installing, configuring, and troubleshooting their systems. Only 15 percent went to initial hardware and software acquisition.

One way to mitigate the hidden user costs is to spend time up front devising a single hardware and software solution for your entire organization, according to Larrabeau.

"Better that your trained staff encounter a problem once and document the solution than your entire remote population get stumped by it over and over," Larrabeau says.

Infonetics reports that half the cost is due to line charges and management expenses. Larrabeau has several suggestions to help reduce communication line costs: "A little line monitoring goes a long way to keeping usage charges down. We find that most companies never delegate anyone to monitor remote-access usage."

Designing a successful remote-access solution requires research and planning. Pacific Bell has a useful on-line publication, the Telecommuting Resources Guide, available at <http://www.pacbell.com/UtilTCGuide>. This guide is a good starting point to help you address issues that go beyond the technical realm: overall cost savings, security risks, and employee relations.

Mel Beckman is a consulting network engineer with Beckman Software Engineering, in Ventura, Calif. He can be reached via the Internet at mel@becknet.com.

REMOTE ACCESS VIA THE INTERNET

It's a seductively simple idea. Rather than buying a central-site server and multiple digital WAN circuits, why not just use the Internet for remote access?

The fly in the ointment is security. Fortunately, this problem can be solved, albeit at some cost. You can use the Internet for unlimited LAN interconnection as long as you establish encrypting fire walls at each site.

Encrypting fire walls protect data that is moved over an intermediate network by establishing secure encoded channels between cooperating gateway. Until recently, such fire walls were expensive—\$10,000 and more, plus the cost of a Unix computer—and difficult to set up and maintain. But a new breed of self-contained fire wall drops that cost to less than \$3,000 per site.

Every node with an encrypting gateway enjoys complete privacy when communicating with a compatible gateway.

Mobile users with analog modem remote access can't utilize gateway-to-gateway encryption, but they can still access some LAN applications by connecting to the fire wall rather than directly to an interior LAN host. The fire wall acts as a proxy, forwarding traffic between the protected host and the remote user once the user has been authenticated.

Although security on the Internet can be bought, reliability is more elusive. The Internet backbone itself is surprisingly resilient. But at its edges, where Internet service providers (ISPs) deliver access, the Internet has a poor reputation for reliability. Here, reliability is a function of each ISP's integrity and commitment to support, and many small ISPs can't provide the quality of service required by corporations. Outages of several hours to a day or more are frequent. Large regional ISPs fare better, and national providers offer service most organizations can live with.

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IS SURVIVAL GUIDE • BOB LEWIS

To measure your staff's productivity is not the same as to improve it

If you can't measure, you can't manage." Hear this much? Probably. What's even more amazing is it's a true statement. More people interpret it, though, as if you can shake a stick at (if you're in the habit of shaking sticks at people who misinterpret management theory).

That's because most people assume the inverse — "If you can measure, you can control" — and they've never heard Lewis' Corollary (not surprisingly, because I just made it up): "What you measure wrong, you manage wrong."

The fact is, establishing the wrong measures will lead to far worse results than establishing no measures at all.

When I was in graduate school studying the behavior of electric fish (I'm not making this up), I read a book by the respected behavioral scientist Donald Griffin. In it, he described the four stages of scientific inquiry:

1. List every variable that can affect a system.
2. Study every variable that is easy to measure.
3. Declare these to be the only important variables affecting the system.
4. Proclaim that the other variables don't really exist.

In establishing quality and performance measures, many managers follow a similar sequence. They end up measuring what's convenient, not what's important.

Here's a simple example, and you've been on the receiving end — often. I guarantee it.

Lots of your suppliers have customer-service call centers. These call centers

have a gadget called an automated call distributor (ACD) running the telephone. Because call center managers can't manage without measuring, and productivity is a good thing (to use a technical phrase), they merrily start measuring productivity.

Now, productivity can be a slippery thing to define. (We'll get into the Productivity Paradox in a future column.) Unaware of the conceptual banana peels littering the floor of productivity definition, our hero starts graphing productivity. The convenient definition: calls per hour. ACDs spit out this statistic sliced and diced in hundreds of different dimensions, so the cost of data collection and reporting is zilch.

So's the value. This brings us to the First Law of Performance Measurement: Employees will improve whatever measure you establish.

Perceptive readers will recognize this as a special case of the more general dictum, "Be careful what you ask for — you may get it."

How might you, a high-performing customer service representative, improve your productivity? Why, you'll be as abrupt as you can, getting rid of callers just as fast as possible. Never mind whether you did anything useful for them. You're maximizing productivity!

Our call center manager now does what any self-respecting manager would do.

He or she starts holding staff meetings, chewing everyone out for being so rude and unhelpful. The productivity graphs, though, stay up on the wall.

Our mythical but all too real manager could have avoided this mess by following the Second Law of Performance Measurement: Measure what's important. The right place to begin in establishing performance measures, then, is to figure out what you care about — what you're trying to achieve.

For a customer service center, what's important? Solving customer problems. What's a good performance measure? Problems solved per hour.

ACDs don't report the number of problems solved per hour, and for that I'm really and truly sorry. On the other hand, a good problem management system ought to be able to handle this one. All it needs is a field identifying repeat calls.

Well, that's not all it needs. If we start graphing this statistic, customer service representatives will do their best to pass on the hard problems to someone else because they don't want to ruin their statistics. Even worse, they may "accidentally" forget to log the hard ones for the same reason.

You need to gauge the relative difficulty of different kinds of problems and use a weighted average. Now, when a customer service representative helps a caller use italics in Microsoft Word, that counts for one problem solved. When someone else helps a caller fix his

SYSTEM.INI file, she gets 10,000 points and a trip to Bermuda. Now there's a measure worth putting on the wall.

Visit me on InfoWorld Electric (<http://www.infoworld.com>) to tell me measurement horror stories, or send E-mail to Robert.Lewis@ps.net.

BOB LEWIS
Bob Lewis is a consultant with Perot Systems Corp., in Minneapolis.

MANAGER'S BOARD BULLETIN

SO MANY TOOLS, SO LITTLE TIME.

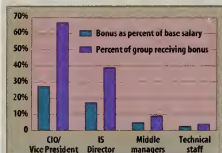
Strategic Focus, a Milpitas, Calif., consulting company, is offering a subscription service designed to help 15 managers select client/server development tools for specific needs. Are you creating an order-entry program but don't have lots of time to train the programmers? Which tool is better if the application needs to be a two-tier program? Which is better if it is a three-tier program? The basis of the service is an evaluation of eight tools, including Powersoft Corp.'s PowerBuilder 4.0, Oracle Corp.'s Developer 2000, and Microsoft Corp.'s Visual Basic 4.0. New products will be added as the evaluations are completed. The evaluations combine raw product testing, ratings by users in different industries, and technology trends. Strategic Focus has a World Wide Web site: <http://www.strategicfocus.com/sf>.

VIVA LA CLIENT/SERVER. Mexico's largest provider of trade finance services has adopted a client/server system with the help of Fairfax, Va.-based American Management Systems Inc. (AMS). Banco Nacional de Mexico (Banamex) is using both the customer front end and transaction processing back end of the AMS TradeLine system to increase efficiency and improve customer service. For example, Banamex has reduced the number of working days it takes to open a letter of credit for a customer from three to one. AMS can be reached at (703) 267-8000.

TAKING A BYTE OUT OF CRIME. IBM is teaming up with San Diego County law enforcement officials on a computer system called the Automated Regional Justice Information System (ARJIS). The multimedia, document imaging, and computerized mapping technologies of the system will provide investigators with such information as arrest records, traffic accidents, and stolen property. ARJIS hardware includes a 4-processor IBM RS 6000 server, PCs, workstations, and text-based terminals running a relational database management system with 33 gigabytes of storage. IBM views the project as a prime example of its network-centric computing strategy.

Who's getting bonuses?

Projected averages for bonuses in 1996, according to a survey of more than 1,700 employers of IS professionals



SOURCE: DOWDEN AND CO.

Calendar

March
2-6 Software Publishing Association Spring Symposium, San Francisco. Contact Narda Kader, (202) 452-1600.

3-8 Shore Technical Conference, Anaheim. Call Theme for this year's "Your Bridge to the 21st Century." Contact Shane, (312) 822-0932; or World Wide Web: <http://www.shore.hg.share.org>.

5-7 Computer Telephony Conference and Exposition 1996, Los Angeles. Exploring synergies between voice processing, data communications,



client/server, and Internet technologies. Contact TelCom Library, (212) 691-8215; or fax: (212) 645-1478.

18-19 Mobile Forum, Burlington, Calif. Confronting the future of mobile

technologies in the computer and telecommunication industries. Contact Rob Johnson at Technologic Partners, (212) 343-1900; or E-mail: events@technologicip.com.

18-22 BrainShare '96, Salt Lake City. Novell's user conference. Contact BrainShare, (800) 833-4862.

22 Gulf Coast Tools Expo, New Orleans. Contact Fax-King Associates, (810) 656-1700.

24-28 Database and Client/Server World Conference and Expo, Boston.

MI Technology Association joins the show. Contact DCL, (508) 470-3880.

25-27 End-User Computing Conference, Miami. Contact Gartner Group, (800) 778-1997.

25-27 Internet & Electronic Commerce '96, New York. Contact Expo Management, (203) 256-4700, ext. 100.

May
20-23 SNAC '96, New York. The System and Network Administration Conference. Contact Miller Freeman Inc., (800) 441-8826.

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Intranet solution makes Geffen shake, rattle, and roll

Record company realizes dream of a fully networked multimedia environment

By Paul Karon

GUNS N' ROSES. Sonic Youth. Elastica. Garbage. Urge Overkill. White Zombie. Lisa Loeb. Weezer. It's probably safe to say that the names of these rock acts don't immediately turn a young person's mind to thoughts of client/server computing, cyberspace, and Windows 95.

Unless, of course, you're Jim Griffin, enthusiastic Internet surfer, Web cruiser, and director of technology for Geffen Records, the influential recording company that produces these and many other acts at the center of today's music scene.

To support the 225 employees who parlay these musicians into a \$500-million operation, Griffin and his IS staff at Los Angeles-based Geffen have created a company intranet that uses existing technology and solutions from an information environment that boasts Internet and other cyberspace solutions.

The result is a cross-platform environment simple enough for business users to learn but robust enough to meet all of their connectivity and cross-platform demands.

ALL TOGETHER NOW. What Griffin envisioned was a fully networked, multimedia environment that would bring together the kinds of data Geffen's employees need to do their jobs, including the music and videos of artists they represent and the financial data residing on mainframes and midrange computers at MCA, Geffen's parent corporation.

In the process, Geffen became one of the first companies to deploy Microsoft Corp.'s Windows 95 in a corporate enterprise setting and put the new OS through its paces. The results, said Griffin, show that a combination of simple and inexpensive Windows 95 and Hypertext Markup Language (HTML) tools can be the basis of a highly flexible and robust enterprise information system, boasting communications and connectivity that rival more traditional—and, in many cases, far more expensive—approaches.

The impetus for the new system was the realization about a year and a half ago that Geffen's information infrastructure was woefully fragmented and inefficient. The company needed a more coherent strategy to take advantage of the benefits offered by the latest technologies. Griffin sat down with his IS staff and brainstormed about ways to create a new information environment for their company.

"We were thinking client/server and realized pretty quickly we needed a cross-platform solution," Griffin says, citing the mix of 60 Macintoshes and 170 PCs used by Geffen's employees.

"That meant [Powersoft Corp.'s] PowerBuilder and [Microsoft's] Visual Basic weren't good choices, because at the time they weren't there for the Mac," Griffin says.

During their search for an internal information platform, the Geffen IS specialists also looked at Lotus Development Corp.'s Notes, but it seemed costly at an estimated \$500 to \$700 per seat, especially for an application whose PC and Mac versions weren't completely identical.

YOU SAY YOU WANT A REVOLUTION. Griffin recognized the potential of the World Wide Web and the Netscape Communications Corp. Web browser to solve the cross-platform information-sharing problems within Geffen that had already been successfully dispensed with on a global scale by the World Wide Web and the Internet.

► Creating an intranet for your company? We'd like to hear your story. Send E-mail to lan_greenberg@infoworld.com.

"The best part is that [companies] like Netscape have already developed these solutions, and they already worked on all Macs and PCs," Griffin says.

The decision to build a Geffen intranet, marked the inception of what Griffin and his colleagues came to call GeffenWorld, the company data crossroads that blends internal and external data resources under a single umbrella.

"There's a lot of information that everyone in the company needs to access," Griffin says.

Data could be generated either internally, as with Geffen's album release dates, or externally, as with radio airplay statistics col-

lected by a separate company that studies the entire music industry and makes its data available on-line via modem.

"In the past, people would go to their computer and dial up various services by modem several times a day," Griffin says.

Now, users need only click on a button in-

ing demands.

"Remote access is real important to us," explains network systems engineer Chris Bradford, who was heavily involved in the Windows 3.x-to-Windows 95 migration.

"About 40 of the 225 PCs in the company are permanently remote, scattered

around the country in regional sales and promotion offices," Bradford says.

Additionally, about a third of Geffen's employees have home computers or laptops that they can use to access the computer resources on Geffen's network—and through that, the Web.

"One click and you're in, and from that point on, it's just like you're at your desktop," Griffin says. This compared favorably with the remote communications of Microsoft's Windows for Workgroups, which required several steps to achieve the same ends.

As for security issues, Griffin says he felt comfortable using Netscape's Secure Commerce Server, which restricts system access by IP address.

Though largely a Novell Inc. NetWare environment, Geffen also uses Windows NT to handle much of the company's remote access.

IT'S A WRAP. The Geffen World intranet does much more than support the information needs of the company's employees. Using the internal Web pages also gives them expertise in the most important new realm of Geffen: cyberspace.

As the on-line multimedia marketplace hungers for new content, Griffin also sees a marketing advantage in providing Geffen's employees with Web and Internet skills. Because Geffen Records—like any music publisher—is an intellectual-property company, says Griffin, employees using their internal computing tools also gain expertise in the very environment that the company may one day do much of its business. Ultimately, Geffen hopes to advertise in cyberspace, as well as create and sell music and other media content over the Internet.

"Why develop two different skill sets?" Griffin asks rhetorically. "A year from now, people in this company are going to be way ahead in their knowledge of these tools. The way I see it, the duty of a CIO or IT director should be to educate the constituency of users."

Paul Karon is a free-lance writer based in Los Angeles.



HEAD OF IS Jim Griffin built an intranet for Geffen Records using HTML tools, Netscape browsers, and Windows 95.

Windows 95 and the Geffen World system accesses the information without requiring the user to know whether it resides on a company server, on the Internet, or wherever.

Less flashy but equally important data, such as phone and E-mail lists, are maintained by various users in each department, who need only learn the not terribly daunting HTML to modify the database, Griffin says.

One other thing: The Geffen World intranet cost only about \$10,000, he says. Much of the cost went to the \$40-per-seat Netscape licenses, although now, with Microsoft giving away its Web browser and server, Griffin says he could put together Geffen's intranet for next to nothing. Hardware costs were minimal because Griffin was able to conscript unused Pentium boxes running Microsoft's Windows NT that Geffen had already purchased.

Geffen's IT staff was drawn to Win95 largely because of their remote computer-

WINDOWS 95'S REMOTE FEATURES MAKE IT TOP DOG

The primary factor behind Griffin and his IS staff's decision to migrate to Windows 95 is the OS's remote features. They are also pleased with Win95's capability for recognizing and interacting with practically every element of Geffen's immediate IS environment, such as the Shiva Corp. LANtivity that handled remote access dial-ins and the extended

environment that included data systems at MCA, Geffen's parent company.

"If Win95 weren't capable of working with all these different systems, I wouldn't be talking this way about it," Griffin says. "Windows 95 has helped us reengineer our company. It's easier for your people to connect from home, if it's easier to tie together all the different systems into one

information resource, you're a more wired company."

Technical superiority notwithstanding, Griffin says the greater value of Windows 95 lies in the obvious human factors, such as training.

"Training on Windows 95 amounts to saying, 'Here's one button that does everything your old computer does,' and you can learn everything else at your own pace," says IS

staffer Jim Dinda, who was part of Geffen's Windows 95 migration team.

The project took all of a month by moving from department to department and making the switch after hours. Laptop users were without computers for two days—the amount of time it took to send their laptops to the Los Angeles office overnight and get them returned.

PRODUCT COMPARISON

CD-ROM server software

Keep the hits coming

Sharing CD-ROMs on a network is tricky, but they're the preferred medium for software and data. These software packages help users gain access to a company's greatest data hits faster than any disc jockey could.

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Logica Information
Systems Inc.

SciNet CD-Manager
3.01
SciNet Inc.

SCSI Express 2.5
for NetWare
Micro Design
International Inc.



You would think that something so simple, so digitally pure as a CD-ROM would play well on today's LAN, but mixing the two is like trying to blend opera and disco. CD-ROMs don't always hit the high notes when it comes to networking, and sharing them across the enterprise will take some effort before the two technologies can truly sing duets.

If the network operating system (NOS) vendors did their jobs properly, there would be no need for this comparison. Sharing CD-ROMs should be no different from sharing tradition-

al media. But CD-ROM server software provides graphical user interfaces to simplify mounting, unmounting, mapping CD-ROMs to network volumes, and substituting understandable 20-character CD-ROM aliases for cryptic names, and it can also outperform NOSes. A solution using NetWare 4.1's built-in CD-ROM-sharing features performed poorly against some of these products in this comparison. It could also take a huge chunk of cash out of your wallet. You can either pay when you have to add memory for each NetWare user who attaches to a server that's doing double duty as a file/print and CD-ROM server, or pay for an additional NetWare user license for each user who attaches to a dedicated NetWare CD-ROM server. Several products in this comparison offer a less expensive solution.

Lee Hauser is a network analyst with Williams, Kastner & Gibbs, a law firm in Seattle. He uses Micro Design International Inc.'s SCSI Express on a NetWare network with 28 different CD-ROMs on-line.

"We have a large number of people who need access to the same CDs, so networked CDs are a very important technology for us," Hauser says.

To some degree, software vendors' sitelicensing policies reduce the cost advantage of sharing CD-ROMs. Customers would prefer flat rates for unlimited numbers of users but must settle for concurrent licenses. But with the prices dropping fast on recordable units, CD-ROMs make perfect sense for archiving your own files on a network. (Of course, getting your users to admit that any of their files are seldom used might take more than just a technical argument.)

Bob Matsuoka is an associate director of the New Laboratory for Teaching and Learning at the Dalton School, a private school in New York. He keeps about a dozen different CD-ROMs on his NetWare network and has archived a great deal of data on his own CD-ROMs.

"We press our own CDs and then make the data available on the network," Matsuoka says. "It is very cost-effective. CD ROMs are still

important for access to archival and reference materials."

Finally, more software now comes on CD-ROMs. The days of flipping floppies to install software — especially software that tops 30MB or so — are just about over. Having the software on a networked CD-ROM is convenient.

"Our users are being swamped with new releases of software and increased demands on their productivity," says Nick Witherspoon at Katz, Aboosh, Windesheim, Gershman & Freedman, P.A., an accounting firm in Baltimore. He raves about his Microtest Inc. DiscPort products and uses a variety of tax and business applications on his networked CD-ROMs.

THE X FILES. Before you get involved in this area, be prepared to spend some time studying the literature and learning almost an entirely new language. Take your basic CD-ROM drive that now comes almost by default with every new PC; You need to first learn what the speed of the drive is and whether the drive has a SCSI or IDE attachment. (Your CD-ROM drive's speed may be 2X, 4X, 6X, or higher: The X refers to a 150KBps transfer rate, so a 4X drive delivers data at 600KBps.)

Next, you should decide whether this drive will remain on an individual desktop or move to a more central — and accessible — location. The drive could be attached to the back of (or inside) your network server, or it could be placed on the network wire directly, similar to the way a printer server is attached. You can also have multiple drive mechanisms bundled together in what is called a "tower" or have multiple CD-ROMs stacked inside a jukebox. The choice depends on your workgroup habits and applications.

"We don't use jukeboxes; we like having all of our CDs on-line all the time," Hauser says.

What makes things more complex is that the basic CD-ROM is not so basic anymore. In addition to standard CD-ROMs, there are now CD-Recordable (CD-R) media, which allow a single write operation to the disc and can be played in standard CD-ROM drives.

Meridian Data Inc. is the first to offer a product that supports CD-R on NetWare. And there are magneto-optical media that allow multiple writes and can't fit in CD-ROM drives.

DIRECTORY ASSISTANCE. Then there is the software configuration:

Do you want each networked CD-ROM to appear as a separate network volume and a separate drive mapping? Or do you want a common "mount point," in which multiple CD-ROMs show up as sub-directories under a single drive mapping? Software can also set up automatic macros so that a single mouse-click can load the appropriate executables and configuration together, making CD-ROM applications more usable. And your enterprise might have a mixed bag of platforms and want to run a variety of Windows, Macintosh, OS/2, and Unix CD-ROMs from the same server, or have multiple users access the same CD-ROM.

"Ease of mapping the drive on the fly is very important," Witherspoon says. The trick is to be able to set up applications that require multiple CDs and still have drive mappings left over for their other networked applications.

"One of our favorite products is Folio Views, but it doesn't have a good method of dynamically mapping network drives," Hauser says. "We had to write our own batch files to make this work."

Networks are always changing, and nowhere is this seen better than with easy-to-swap media such as CD-ROMs.

"Windows is still a big headache when it comes to switching CDs," Matsuko says. "The Mac is much easier: We just create aliases to volumes and place them in a specific location on our network. It is simple enough for first-graders to use — literally!"

PICK THE RIGHT SOFTWARE. When we first began testing these devices, we looked at both hardware and software alternatives and quickly discovered that the hardware was largely the same in terms of performance and configuration. The more important issues boiled down to software choices, and that's what our product comparison focused on.

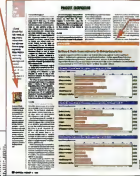
We were disappointed that we didn't see more cross-platform support than we did. None supported any Unix clients, and even Macintosh client support was paltry. We were also disappointed that months after the Windows 95 rollout, all but one product's Win95 client were running in 16-bit compatibility mode. Native Win95 support is in order.

But this need for cross-platform support is precisely why these products may live on, even when the NOSes improve. Several NOS vendors, particularly Microsoft Corp., continue to have their own desktop operating system agendas, which keep them from fully supporting rival desktop operating systems.

A guide to this comparison

080 Why pay more?

Read the story published on InfoWorld Electric to find out how you can build a CD-ROM tower of your own for a lot less money than these vendors want to charge you.



072, 78 It's physical, it's logical:

To help you better understand how we tested CD-ROM networking software, refer to these two diagrams: One shows the physical setup in the Test Center, and the other shows the three speed performance tests in a logical diagram.

080 The good, the bad, and NetWare: Three different tests showed off the strengths and weaknesses of the software compared, and a NetWare-only solution managed to outperform some products on some tests.

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Results at a glance

Or five-way CD-ROM server software comparison produced a clear winner and a loser, with a 2-point range separating the two, and three contestants bunched in the middle. The winner had the handicap of a high price, and the loser was among the least expensive — so maybe, in this product category, you get what you pay for.

With the exception of Meridian's CD Net for NetWare, these products were overly complicated for what they were designed to do. These products need to mature some and develop simplified user interfaces. CD Net, on the other hand, suffered from being a bit too simple.

The essential idea behind a CD-ROM server is to map a local drive to either one CD-ROM volume or a number of volumes, and then provide speedy access to users. The winner, Microtest Inc.'s CD-Now 2.11 for NetWare, has what it takes. It offered an outstandingly easy setup for both server and clients. CD-Now won two of our three speed tests, and only one CD-ROM could map Macintosh clients to our CD-ROM drives without an add-on. The user interface was a bit confusing, but we liked elements of it, such as drag-and-drop drive mapping. At \$2,495, however, CD-Now was pricey.



Meridian Data Inc.'s CD Net 1.0 for NetWare and ScilNet Inc.'s ScilNet CD-Manager 3.01, two very different products, tied for second place. Where CD Net has recently been reborn as a NetWare Loadable Module, CD-Manager remains based on a DOS application. Perhaps for that reason, CD-Manager was the faster of the two products, while CD Net was slowest in one test and quite slow in two others. Both installed fairly cleanly and offered average cross-platform capabilities. Security was solid, but both products had flaws in this area. CD Net only allows access by groups, instead of by

individual users. CD-Manager forces you to use NetWare 3.12s Syscon utility to administer groups. Also, CD Net might be a strong solution for smaller networks with simpler needs.

Logisoft Information Systems Inc.'s LanCD 3.2 won one of our speed tests but posted average or below-average times on the other tests. With its own home-grown administration and security, LanCD has the disadvantage of not being capable of tapping into network operating system security such as NetWare provides, with the added hassle of requiring administrators to install a client component on all workstations in order to allow users to map drives.

Micro Design International Inc.'s SCSI Express 2.5 for NetWare was slowest in two of three tests, and the drawbacks didn't stop there. Setup matched a familiar NetWare user's tale of having to tweak configuration files before we could perform the installation successfully. Cross-platform support was ordinary, and SE-View, the client user interface, has a bit of a learning curve. SCSI Express was also the only product that couldn't handle more than eight assigned trustees per network volume. The only outstanding feature of SCSI Express was its extended telephone support hours.

RELATED ARTICLES

Dec. 4, 1995,

page 119

Plump up your volumes: CD server pair manages discs by the dozen. We evaluated Microtest Inc.'s DiscPort Tower for NetWare with four 4X drives, a hardware/software combination; we also credited Meridian Data Inc.'s CD Net 1.0 for Windows NT.

Nov. 20, 1995,

page 26

Demand for CD recorders grows as prices plummet: Fall Comdex saw the introduction of more affordable CD-ROM recorders from Finnado Micro Inc., Plasmon Data Inc., Teac America Inc., Pioneer New Media Technologies Inc., and MicroNet Technology Inc.

Sept. 25, 1995,

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Warning camps agree on standard for high-capacity CDs: Two rival groups of vendors still are on the standard for the next generation of high-density CD-ROMs, which will hold 18.2 gigabytes of data. The new drives for these Super Density CD media will be capable of playing existing CD-ROMs.

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Report Card

CD-ROM server software

GUIDE

- Rating
 Score in points
 See this page for information report

InfoWorld reviews only finished, production versions of products, never beta test versions. Products receive ratings ranging from unsatisfactory to excellent in various categories.

Scores are derived by multiplying the weighting of each criterion by its rating, where: Excellent = 1.0 - Outstanding in all areas.

Very Good = 0.75 - Meets all essential criteria and offers significant advantages.

Good = 0.625 - Meets essential criteria and includes some special features.

Satisfactory = 0.5 - Meets essential criteria.

Fair = 0.25 - Falls short in essential areas.

Unsatisfactory or N/A = 0.0 - Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little.

Weightings represent average relative importance to InfoWorld readers involved in purchasing and using that product category. You can customize the Report Card to your company's needs by using your own weightings to calculate the final score.

The Test Center Hot Pick is InfoWorld's award for outstanding products. To receive the Test Center Hot Pick seal, a product has to offer what InfoWorld deems to be a stand-out feature or technology that is unusually valuable or revolutionary compared to competitors. The product must also score at least satisfactory in all Report Card categories and receive a final score of 7.0 or more.

	Weighting	CD Net 1.0 for NetWare	CD-Now 2.11 for NetWare	LANCD 3.2
		Meridian Data Inc. Scotts Valley, Calif. (800) 767-2537, (408) 438-3100 World Wide Web: http://www.meridian-data.com	Microtest Inc. Phoenix (800) 526-9675 World Wide Web: http://www.microtest.com	Logcraft Information Systems Inc. Nashua, N.H. (800) 880-5644, (603) 880-0300 World Wide Web: http://www.logcraft.com
Performance				
Setup	100	Very Good 75.00 Fair 72 Of the three NetWare Loadable Module-based products, only CD Net let us copy program files to the data volume or directory of our choice. Optional client setup was just as easy as setting up the server.	Excellent 100.00 Fair 72 CD-Now's setup went flawlessly and it was the only product that automatically loaded the correct Ethernet frame type. The optional client installation was also a snap.	Satisfactory 50.00 Fair 75 We weren't pleased with the server setup work LANCD left us to do, including copying network card drivers and editing NETCFG. It could have been done by the install utility. Client installation was easy.
Speed	225	Satisfactory 112.50 CD Net was slowest during its four-CD-ROMs/five-clients (CH State Tax Reporter test, and second-slowest in both PhoneDisc PowerFinder tests (one CD-ROM/five clients) [where it was slightly slower than NetWare] and five CD-ROMs/five clients).	Very Good 168.75 CD-Now was fastest in two of three tests: PhoneDisc PowerFinder (one CD-ROM/five clients) and CH State Tax Reporter (four CD-ROMs/five clients). It was second-fastest, behind LANCD, in the PhoneDisc five-CD-ROMs/five-clients test.	Very Good 168.75 LANCD was fastest in one of three tests: the PhoneDisc PowerFinder five-CD-ROMs/five-clients test. It was second-fastest in the CH State Tax Reporter four-CD-ROMs/five-clients test, but next-to-last in the PhoneDisc one-CD-ROM/five-clients test.
Cross-platform support	225	Satisfactory 112.50 Although CD Net can map drives under DOS, Windows, and OS/2, it falls in support for the Macintosh or Unix. The DS/2 support allows users to map to a NetWare directory and use the Windows emulation mode of DS/2 in order to run the client application.	Very Good 168.75 Daily CD-Now was capable of mapping Macintosh clients to our CD-ROM drives, although we had to perform this via NetWare. It uses Windows emulation for DS/2 clients. Like the other four products, CD-Now does not support Unix clients.	Satisfactory 112.50 Although LANCD provides a native administrative shell for the Macintosh, it is not included in the basic cost. LANCD was the only product compared that provided a native Windows 95 graphical user interface. It does not support Unix clients. Windows NT client support is an option.
Usability	125	Good 78.13 Fair 75 CD Net was the easiest product to use, but we could not operate it from the server console. Each CD-ROM can appear as a subdirectory of a NetWare volume. Launch icons can mount a CD-ROM automatically and reclaim the drive letter when the user exits the application.	Good 78.13 Fair 75 By putting both drive mapping and administration tasks into one application, Microtest introduced an element of confusion into CD-Now. Grouped-out icons meant different things in different parts of the DiscView Pro application, but we liked the drag-and-drop drive mapping.	Good 78.13 Fair 78 The user interface was easy to use, although as with CD Net, we could not manage the CD-ROM server from the console. We liked the ability to drag a volume name from the dialog box for mounting drives into the desired drive letter. The virtual drive letter feature is a mixed blessing.
Security	125	Good 78.13 CD Net does not incorporate any advanced security features, and it does not allow you to edit any NetWare trustee assignments from its administration console. To change a user's rights, an administrator must use a NetWare-provided utility. CD Net has another problem with NetWare: There is no way to give a single-user account access to a CD-ROM; CD Net will only allow access by groups. This means that, at the very least, an administrator will have to create one more group, even if he wants to give only one user access to a CD-ROM.	Satisfactory 62.50 Although CD-Now and its DiscView Pro client are NetWare security-based products, we found an instance where the built-in security features failed to notice that we had changed the user's rights with NetAdmin, NetWare's object management utility. After removing the rights of a user to see a specific volume, we tested to see if that user could still access the CD-ROM server. Although our user could no longer see anything on the server's hard drive, he could still see the CD-ROM volumes themselves. Meanwhile, DiscView Pro told us the user still had rights. Microtest acknowledges the shortcoming.	Satisfactory 62.50 LANCD does not support any NetWare security features. To a NetWare server, LANCD servers appear to be just another client. A user must have the LANCD client installed to access any CD-ROM drives. All the security features provided with that environment worked fine. Locking, unlocking, and changing rights worked well.
Support and pricing				
Documentation	50	Very Good 37.50 CD Net's manual is accurate and informative, with good screen shots and accompanying text. It also provides good tips. The manual describes configuration files loaded onto the server, as well as what each file within them does to the software.	Excellent 50.00 Microtest's manuals are instantly likable, with clear and concise diagrams, well-chosen screen shots, a glossary of terms, and troubleshooting tips.	Good 31.25 The documentation borders on overkill. It has a screen shot of almost every screen available on the product. Much of one manual is taken up with configurations of various networks and the files we needed to edit before installation begins.
Support policies	50	Good 31.25 CD Net's one year of free, toll-free phone support wasn't quite as good as CD-Manager's. However, on-line forums, including an anonymous File Transfer Protocol server, and 10-hour, per-weekday phone support put CD Net well above par.	Good 31.25 Though it's 30 days of free, toll-free phone support are the least of any vendor, CD-Now is the only one to offer fax-back support. Extended phone support hours and on-line support are available, but there's no money-back guarantee.	Very Good 37.50 LANCD's free, toll-free phone support lasts for 90 days; only CD-Now's support lasts for less. There is a money-back guarantee. With LANCD's 10 hours of phone support, only CD-Manager's hours are shorter.
Technical support	50	Very Good 37.50 Meridian triumphed in our server evaluation. Hold times were short, and every response from staff members was on target, demonstrating their knowledge and willingness to share it.	Satisfactory 25.00 We got answers to our questions, but awarded Microtest a default score because its support referral system didn't allow anonymous technical calls.	Unacceptable 0.00 Hold times were brief, but after being assured that technicians would get back to us, Logcraft failed to return any of our calls.
Pricing	50	Good 31.25 Our 100-user configuration cost \$1,495, making CD Net the second-most-expensive product.	Poor 12.50 CD-Now was the most expensive product at \$2,495 for 100 users.	Good 31.25 At \$1,395, LANCD was on the less-expensive end of the range for our 100-user requirements.

Final score

5.9

7.0

5.7

HOW WE TESTED

CD-ROM SERVERS HAVE ONLY one purpose in life: to allow huge volumes of information to be accessed by clients. An ideal CD-ROM server does so quickly, securely, and transparently to users.

We tested performance using a Hewlett-Packard Co. NetServer 5/66 I.F. (Pentium-based system) with 32MB of RAM, 1 gigabyte of hard disk space, an Adaptec Inc. AIC-7770 on-board SCSI controller, and a Compaq Computer Corp. NetFiber 2 network interface card (NIC). This server ran whatever operating system the CD-ROM software vendor required. Because we saw that as few as two clients could drive a server to 100 percent utilization, we chose to consistently dedicate the NetServer to CD-ROM service, even though our readers were evenly divided on their requirements for a dedicated server.

A Compaq ProLiant 4500 was our log-in server, acting as the root of our Network Directory Services (NDS) tree for CD-ROM server software that supports NDS.

All speed tests were performed using a seven-CD-ROM SCSI tower provided by Microtest Inc. Because Microtest's CD-Now 2.11 for NetWare was a competitor in the software comparison, we also performed baseline tests with Meridian Data Inc.'s CD NetBios tool. The tower used Sony quad-speed CD-ROM drives, each with a 256KB cache.

For clients, we used three HP Vectra 66-MHz 486s and two Gateway 2000 Inc. 33-MHz 486s. All clients had 8MB of RAM, a 30cm Corp. EtherLink III NIC, DOS 6.22, and Windows 3.1.

PERFORMANCE Setup

In a recent survey, *InfoWorld* readers said the setup of CD-ROM servers is a very important consideration when selecting products. We tested each product by installing it on our server, and then, if a product had a client-side component, we installed it on each of five clients. We first performed the server portion of the installation, using the server console or a client logged in as an administrator, as appropriate.

We awarded a score of satisfactory to products that a network administrator could install relatively easily, even if there were minor bugs or batch files that needed editing.

We added points if the product made all the necessary changes to batch files or if it installed flawlessly. We also added points for those products that configured themselves without our intervention.

We deducted points from products that were especially difficult to set up on the clients or server. We also deducted points if we had to call technical support to complete the installation.

Speed

Many variables affect CD-ROM server performance: drive speed, server memory, the number of clients, and the variety of client requests. Most important, though, is the software that allows CD-ROMs on the server to be used by clients on the network.

To simulate a wide variety of CD-ROM usage, we divided our performance/speed tests into three models.

The first two tests used the 1995 edition of PhoneDisc PowerFinder, a database of White and Yellow Pages for the entire United States, published on five CD-ROMs by Digital Directory Assistance Inc., in Bethesda, Md.

In test one, we used five clients to look up preprogrammed names and numbers on five different CD-ROMs, with each CD-ROM dedicated to one client. The second test was similar to the first, but rather than having each client search a different CD-ROM, we concentrated the searches of all five clients onto a single, if overworked, CD-ROM.

In our third test, we used CCH State Tax Reporter, a database of court rulings involving state taxes in all 50 states, published on four CD-ROMs by CCH Inc., in Chicago. When our test searched for cases involving predetermined keywords, the CCH software had to look at all four CD-ROMs to compile a list of matching documents.

We ran all performance tests twice and averaged the times. We scored on a relative scale, with the fastest product in the comparison receiving the maximum points for that test. All other products received a fraction of the available points, based on their performances relative to the top performer. For instance, a product that took twice as long as the fastest product to complete a test received half the available points for that test.

All three tests were worth 75 points each, for a combined total of 225 points. We added the points from each test and gave word scores as follows: scores of excellent needed 215 to 225 points; scores of very good required 159 to 214 points; scores of good needed 131 to 158 points; scores of satisfactory required 102 to 130 points; poor ratings fell between 55 and 101 points; and a product receiving fewer than 55 points was given a score of unacceptable.

► How we tested, page 79

SciNet CD-Manager 3.01

SciNet Inc.
Santa Clara, Calif.
(800) 653-1010, (408) 492-9365
World Wide Web: <http://www.scinetcorp.com>

▲ Very Good ● 75.00 ▮ 75

The DOS-based CD-Manager installed cleanly, and the serial number it requested was in the manual, unlike SCSI Express. No client installation was necessary or possible.

▲ Good ● 140.63

CD-Manager was second-fastest in the PhoneDisc PowerFinder one-CD-ROM/five-clients test, but in the middle in the other two tests; moreover, it was slower than NetWare in the PhoneDisc five-CD-ROMs/five-clients test.

▲ Satisfactory ● 112.50

Although CD-Manager emulates NetWare and supports a wide range of clients, including Windows NT, it cannot support Macintosh clients on a network. CD-Manager also lacks a graphical user interface and cannot support Unix clients.

▲ Satisfactory ● 62.50 ▮ 78

With no Windows user interface, CD-Manager nevertheless offers an easy and efficient interface that provides complete, rapid access to all functions. You need to use SysCon—the bare of NetWare 4.1 users—to edit user and volume information, though.

▲ Good ● 74.13

CD-Manager like LANCD is DOS-based; yet, unlike LANCD, it still uses true NetWare security. It requires you to use NetWare 3.x's Syscon. There are easier NetWare security interfaces to use, such as NetWare 4.x's NWAdmin, but you can't use NWAdmin to add or change CD-Manager users or to change their rights, because CD-Manager does not support NetWare Directory Services except through bindery emulation. Aside from this detail, the security features perform as if this was a true NetWare 3.x server.

▲ Excellent ● 50.00

The single manual was small but extremely efficient and well written. The first page, before the contents, contained the technical support telephone and fax numbers—no hunting through indexes to find them.

▲ Very Good ● 37.50

Only CD-Manager provides unlimited, free toll-free phone support, though its hours are the shortest. SciNet provides a 30-day, money-back guarantee for the product.

▲ Unsatisfactory ● 0.00

Our calls to SciNet's technical support fell on deaf ears. On one occasion, we spoke to a message-taking attendant; the second time, we left a message on voice mail. We received no return calls.

▲ Very Good ● 37.50

CD-Manager tied with SCSI Express for best price—\$895 for 100 users.

5.9

Micro Express 2.5 for NetWare

Micro Design International Inc.
Winter Park, Fla.
(800) 228-0891, (407) 677-8333
World Wide Web: <http://www.microdes.com>

▲ Satisfactory ● 50.00 ▮ 75

We had to install NetWare first, then tweak its start-up files until SCSI Express was happy. Then we had to unload NetWare's CD-ROM drivers. But after that, things smoothed out, including client installation.

▲ Poor ● 56.25

SCSI Express was slowest in two of three tests: the PhoneDisc PowerFinder one-CD-ROM/five-clients test and the PhoneDisc five-CD-ROMs/five-clients test. It was second-slowest in the CCH State Tax Reporter four-CD-ROMs/five-clients test.

▲ Good ● 140.63

SCSI Express managed to provide support for Windows 95, Windows NT, and OS/2 using its Windows 3.x client. Although this provides administrative functions for these platforms, native clients for each OS would have been a welcome addition. There was no support for Macintosh or Unix clients.

▲ Good ● 78.13 ▮ 79

If you just want to administer the CD-ROM server, stick to the server console. SE-View, the client interface, was a little cryptic, though we eventually got the hang of it.

▲ Good ● 78.13

Although the SCSI Express security features worked without any problems—we locked and unlocked drives, assigning and revoking rights—we did add our number of assigned trustees per volume. If you want nine or more trustees, you need to create groups in order to allow access, which creates more work and planning for the administrator. In its defense, Micro Design maintains that the average administrator would prefer to drop a user from a network group in order to remove the user's rights; but we would still prefer a higher number of trustee assignments.

▲ Poor ● 12.50

Although the manual was detailed and covered in depth most tasks that we needed to do, it fell short in depicting the software in its screen shots. One page shows a fictitious screen shot.

▲ Excellent ● 50.00

SCSI Express is one year of free, toll-free phone support is better than most. Its extended support hours are the best of the bunch. Micro Design provides a 30-day, money-back guarantee.

▲ Unsatisfactory ● 0.00

We got through successfully only once. Although this one call was informative and resolved the issue, we also had an unreturned call and another where the voice mailbox was full.

▲ Very Good ● 37.50

At \$895, SCSI Express tied with CD-Manager as the least expensive 100-user solution.

5.0

Product overview

CD Net 1.0 for NetWare

Meridian Data Inc. has the oldest pedigree of any vendor in this comparison. Its first CD-ROM server software, CD Net, was introduced in 1988. In 1990, the company offered the software separately from the hardware for the first time, and in 1993, it introduced CD Net Plus. Version 6 introduced "volume grouping," a term for mounting CD-ROMs as subdirectories of a network resource, when it shipped last June. CD Net Plus also replaced an older terminate-and-stay-resident architecture with a true Windows client driver. Version 6, which sells for \$1,995 for 100 users, remains on the market as a peer-to-peer networking solution that does one thing the new CD Net 1.0 for NetWare, released in January, does not: support Macintosh namespace and hierarchical file system disks.

Earlier incarnations for NetWare operated only in peer-to-peer fashion, but CD Net 1.0 is the first NetWare Loadable Module (NLM) version. It let us create NetWare volumes that were accessible from any supported NetWare client. CD Net Plus requires you to load Windows device drivers on each client to see the CD-ROMs; the NetWare version has no such requirement. Meridian strongly recommends 32MB of memory on the server, though it's possible to operate with 16MB.

Meridian also offers CD-ROM server software for Windows NT and Banyan Vines operating systems (for \$1,995 each).

CD-Now 2.11 for NetWare

Microtest Inc. entered the CD-ROM server software market with DiscServ, an NLM, in August 1994. In May 1995, CD-Now, which combines a limited version of NetWare with the DiscServ NLM, was born with a version of NetWare that provided

enough operating system power to build a stand-alone CD-ROM server but did not allow clients to use it for file and print services.

As with several other products, you can assign a more descriptive name to CD-ROMs from the Volume Configuration dialog box. For example, a CD-ROM with the volume name OFF950 90601 may not be very helpful, but naming it MS_OFFICE is much better. Though its SmartLaunch feature, CD-Now can propagate changes in the CD-ROM server application set to the users' desktops. For example, it can add new icons to their desktops the first time they log into Windows following a change at the CD-ROM server. CD-Now 2.11 shipped last September, adding support for Pioneer New Media Technologies Inc.'s 5004 and for NSM Jukebox America Inc.'s Mercury 40 and Mercury 100/XA jukeboxes. Version 2.11 also added support for CD-ROM towers with logical unit number expanders, devices that permit a SCSI bus to accommodate as many as 49 devices instead of the usual seven. Version 2.11 also supports additional types of SCSI adapters.

CD-Now requires a 386 processor, 16MB of RAM, and 90MB on the server's hard drive. NetWare clients are forced to hook up with no additional setup.

LanCD 3.2

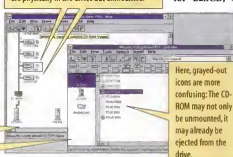
Logicaft Information Systems Inc.'s LanCD was first developed in 1991, and when Version 3.2 shipped this past December, improvements included Windows NT client support and several optional extensions. A metering facility is built into the server that lets administrators specify how many users

can connect to any one volume. With Version 3.2, metering supports the concurrent-use licensing model, which can help you save money on licenses that are not constantly in use.

The license database can create aliases of 20 characters that clients can automatically see, replacing cryptic volume names.

For servers with plenty of hard disk

Grayed-out icons here represent CD-ROMs that are physically in the drives but unmounted.



space, LanCD also features a static disc cache, which allows administrators to create multiple virtual CD-ROMs on a SCSI hard drive and move the entire contents from the actual CD-ROM to the virtual CD-ROM. LanCD gets around requiring NetWare for drive mapping by using proprietary software on each client. Essentially, that involves the use of NetWare's SPX transport protocol to create a peer-to-peer network between the CD-ROM drives and the clients—a model other vendors are abandoning, despite advantages such as concurrent multiprotocol support.

Specifically, from a single LanCD server you can load four different protocols: some combination of NetWare SPX/IPX, TCP/IP, Banyan Vines, and three NetBIOS protocols; Microsoft Corp. LAN Manager; IBM LAN Server; or Digital Equipment Corp. Pathworks.

LanCD servers require at least DOS 5.0, a 386 processor, 8MB of RAM, 80MB of disk space, and a SCSI interface for the CD-ROM controllers. If a jukebox will be used, a serial port must be present.

DOS clients need a 286 processor, DOS 5.0 or greater, 32KB of RAM for the TSR and extensions, and 250KB of space on the hard disk. Windows clients require 250KB of disk space.

Logicaft offers a bery of options for LanCD, starting with TCP/IP

support, which is an additional \$495 per server for DOS and Windows. The LanCD Macintosh client, which includes TCP/IP support, is \$995 for 50 users. A Windows NT client is \$695 for 50 users. Another option called FastCD dynamically

caches portions of CD-ROMs on SCSI hard disks for speedier performance; this option is \$600. The Jukebox Manager, starting at \$500, connects and manages jukeboxes with as many as 50 platters. Adding capacity beyond 50 platters costs an additional \$10 per platter. Hardware supported by the Jukebox Manager includes Pioneer 604, 624, 1804, and 5004; and all CD-ROM models made by NSM, Kubik, and Disc Inc.

SciNet CD-Manager 3.01

Upastart company SciNet Inc. has the youngest product in the comparison. Barely 1 year old, SciNet CD-Manager was first introduced in February 1995. The latest version, 3.01, was released last November, and its improvements include volume grouping, which allows multiple CD-ROMs to be mounted as one volume.

GLOSSARY

Burst transfer rate: The rate at which small chunks of data can be sent from the CD-ROM, as opposed to sustained transfer rate, in which data is sent in a continuous stream.

ISO 9660: Standard format for data CDs that specifies directory architecture and naming conventions.

Jukebox: A CD-ROM device that uses a robotic mechanism to move the desired CD into the drive slot. Slower than a tower that employs one drive per CD, but capable of handling large numbers.

Logical unit number (LUN): As defined by the SCSI standard, each SCSI device ID can be divided into eight LUNs.

Platter: A name for a single CD-ROM. A jukebox can hold anywhere from six to several hundred platters, though it may have only one or a handful of drive drives.

SCSI ID number: The number assigned to a SCSI device to identify it on the chain. SCSI devices are numbered 0 through 7.

Tower: Also known as an array, typically refers to a unit where each drive is connected to a controller, with no robotic mechanism to move CD-ROMs, which are always on-line.

Support policies

	CD Net 1.0 for NetWare	CD-Now 2.11 for NetWare	LanCD 3.2	SciNet CD-Manager 3.01	SCSI Express 2.5 for NetWare
Yes ☐ No					
Free telephone support period	1 year	30 days	One-year maintenance is solid for 20 percent of the retail price.	Unlimited	Extended warranty is available; \$150 for the second year. Upgrades cost \$100 for the first year and \$250 for the second year.
Cost and details of paid phone support	Custom	Seven plans available, from a \$259-per-minute consultation line to the Premium Plan, which costs \$4,500 per year and guarantees customers a response within 15 minutes, free software updates, and highest call priority for technical support.			
Toll-free help line	☐	☐	☐	☐	☐
Money-back guarantee	☐	☐	30 days	30 days	30 days
Fax-back support	☐	☐	☐	☐	☐
Private BBS support	☐	☐	☐	☐	☐
Internet E-mail support	☐	☐	☐	☐	☐
Anonymous FTP server	☐	☐	☐	☐	☐
World Wide Web support	☐	☐	☐	☐	☐
CompuServe support	☐	☐	☐	☐	☐
Telephone support hours	Weekdays from 7 a.m. to 5 p.m. Pacific time	Weekdays from 6 a.m. to 5 p.m. Mountain time	Weekdays from 8 a.m. to 6 p.m. Eastern time	Weekdays from 8 a.m. to 5 p.m. Pacific time	Weekdays from 8 a.m. to 8 p.m. Eastern time
Support policies score	Good	Good	Very Good	Unacceptable	Excellent
Technical support score	Very Good	Satisfactory	Unacceptable	Unacceptable	Unacceptable



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CD-Manager emulates a NetWare server, but you'll still need a separate server running NetWare 2.x and higher to act as the LAN server.

The server running CD-Manager must have at least a 386 processor, 2MB of RAM, and an interface card for the CD-ROM drives. CD-Manager uses Novell Inc.'s NetWare Core Protocol to appear as a NetWare server. Clients just need to be hooked up to the network.

CD-Manager also lets you create alias names to turn cryptic names such as DEMO10395 into the friendlier DEMO_95. A fixed or locked status feature lets you either enable or disable an alias.

■ SCSI Express 2.5 for NetWare

The first version of SCSI Express shipped in 1990. Micro Design International Inc. says its product was the first to provide a CD-ROM as a NetWare volume rather than using a proprietary drive mapping mechanism. The latest incarnation of SCSI Express, Version 2.5, shipped in December and introduced a new graphical user interface.

Whereas before the user selected an application from a list of application names, now the program offers groups of icons. Trash cans and other icons for saving settings as well as mounting, updating, and ejecting CD-ROMs were

also added to SCSI Express.

Another nifty feature in Version 2.5 handles the pesky problem of CD-ROMs that get updated monthly. If you mount that month's CD-ROM and the volume name is keyed to the month, you can train SCSI Express to automatically change the volume name to a pre-defined name. This way, you need not redo any security assignments or namespace settings.

Version 2.5 also lets a network administrator perform a "push" install of CD-ROM-based applications, so the next time the user opens Windows and double-clicks on the icon of the application being updated, installation of the update will happen automatically.

The product installs itself as multiple NLMs and requires at least a NetWare 3.11 server. It also needs about 1MB of additional space on the hard drive.

Any DOS client on the network can map to the CD-ROM servers. If you like clients to use the new GUI, they should have 1MB of disk space for the files. Windows 3.11, Windows for Workgroups, Windows 95, Windows NT, and OS/2-Windows machines can also use the new GUI.

If you are going to use the original CD-ROM volume names and your users know them, then there is no need to set up SE-View, the client utility of SCSI Express. You simply map a drive on the client to the relevant volume.

► Despite the hype at last fall's Comdex show, the Super CD format is not that close. According to officials at Micro Design International Inc., the first Super CD products won't appear until November, and then only in consumer audio and video products. It will be early next year before the first Super CD-ROMs appear.

Setup

■ CD Net 1.0 for NetWare

VERY GOOD

Instead of setting up CD Net at the server console, we were instructed to install it from a workstation with administrator privileges.

We used the usual FILE/RUN/SETUP procedure and selected the user and administrator installations in addition to the NetWare Loadable Module (NLM) installation. The software would not install both the user and administrator, so we didn't select the user option.

Next we chose the default as the destination directory, and we got a drop-down list of servers we could install to. We selected the NetServer and proceeded with the setup. CD Net lets you choose a data volume and directory on the target server.

Although we chose the default, CD Net was the only NLM we evaluated that gave us a choice of where to put the program files. We also let CD Net update the AUTOEXEC.NCF file, although it gave us the opportunity to manually edit the file after installation.

After completing the installation, we simply typed LOAD CDNET at the NetWare server console. No client setup was required.

■ CD-Now 2.11 for NetWare

EXCELLENT

Installing CD-Now was a painless and simple process. After setting up the server to see one of our seven CD-ROM drives from DOS, we inserted the CD-Now CD-ROM and typed DA INSTALL. CD-Now set itself up in a similar fashion to NetWare, but with fewer installation questions to answer.

We were prompted to name the server, then we were asked the usual hard disk and network card driver questions. We then selected the appropriate EISA slot number for the Hewlett-Packard Co. NetServer, Adaptec Inc. on-board AIC-7770, and Compaq Computer Corp. NetFlex 2 card, and inserted the required license disk.

CD-Now was the only product that automatically loaded the correct Ethernet frame type; with the other products, we had to make the selection ourselves or preinstall the NetWare requester.

After we selected a NetWare Directory Services tree to join, the install program started to copy the required files from the CD-ROM to the local drive. At this point, the manual recommended that we take a 15- to 20-minute break.

After successfully installing the server software and bringing it on-line, we

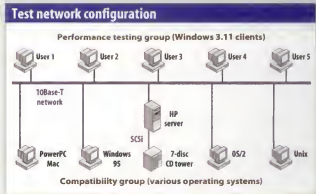
installed the DiscView Pro client. This also was straightforward. We mapped a drive to the CD-Now server from the client and, from the Windows Program Manager, ran FILE/RUN/NETSETUP.EXE from the network drive we just mapped. After selecting our destination path and

directory, DiscView Pro took over.

The DiscView icon gave us a configuration screen. We entered the user name and password for the management application and assigned a name to the host adapter on our server, which distinguished that adapter from others on

Performance and compatibility testing

There were two parts to the network we created to test CD-ROM server software. The first group consisted of five DOS/Windows 3.11 PCs that were used for the speed tests. We set up the second group to test the vendors' claims of supporting other operating systems and architectures.



COMING SOON

Look for a product comparison update soon on Omnetix Technology Inc.'s latest solution, CD Vision 3.0 and CD Commander 1.02.

Cross-platform testing

Hit-and-miss support for client platforms

We tested each product's support for a variety of popular client operating systems. We mapped drives using NetWare map command. A product capable of mapping Windows 95 clients to CD-ROMs assured that NT clients would work. Map only means we could map a volume using NetWare; Map/GUI means the map facility works and a graphical user interface is available for that platform.

	CD Net 1.0 for NetWare	CD-Now 2.11 for NetWare	LaTeX 3.2	Splitter CD-Manager 3.01	SCSI Express 2.5 for NetWare
DOS 6.22	Map only	Map only	Map/native GUI	Map only	Map only
Windows 3.11	Map/native GUI	Map/native GUI	Map/native GUI	Map only	Map/native GUI
Windows 95	Map/compatible GUI	Map/compatible GUI	Map/native GUI	Map only	Map/GUI CE*
Windows NT	Map/compatible GUI	Map/compatible GUI	Map/compatible GUI ¹	Map only	Map/GUI CE*
OS/2	Map/compatible GUI	Map only	Map only	Map only	Map/GUI CE*
Macintosh	No support	Map only	No support	No support	No support
Linux (Unix) for NFS ²	No support	No support	No support	No support	No support

1. Linux version was Stackware Linux (Network File System).

2. Logcraft provides Windows NT map/GUI support as an option.

3. Logcraft provides Macintosh map/GUI support as an option.

4. Denotes that the GUI only runs with NetWare binary emulation on.

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9. What capacity hard drives do you want installed?

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(B) VGA (E) Passive Matrix VGA
(C) MonoVGA (F) Other

11. What additional drives do you want installed? (Write in code)

- (A) 1.2 FD (D) SCSI
(B) CD ROM (E) Other
(C) Tape Backup

12. What operating systems do you want installed? (Write in code)

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(B) Windows (F) NetWare 3x
(C) Windows 95 (G) NetWare 4x
(D) Windows NT (H) UNIX

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the server. You can't do this on any of the other products.

■ LanCD 3.2

SATISFACTORY

LanCD 3.2's setup was not as smooth as other products'. The first thing the manual instructed us to do was set up the network interface cards (NICs). Depending upon which network is running and what protocols are used, several different pre-installation configurations should be carried out.

Prior to installation, we had to edit our AUTOEXEC.BAT and CONFIG.SYS files on the server. We had used Adaptec Inc.'s EZ-SCSI to install the SCSI controller software, but because LanCD uses its own CD-ROM driver, we needed to remove any references in those files to the Adaptec drivers and the Microsoft Corp. extensions, with the exception of the ASP/DOS/SYS device statement. Then we ran INSTALL from drive A: and installed the LanCD server files and the IPX/SPX protocols. We confirmed the directory location before we were prompted for the location of our NETCFG file.

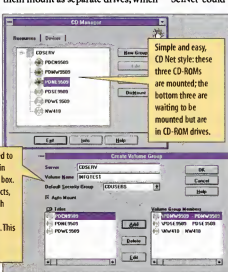
We needed to copy our network card driver from the NIC's installation disk to the hard drive, and we needed to add that driver to the AUTO EXEC.BAT, as well as edit the NETCFG file to specify it as the link driver. A prompt for the network card driver disk would have been an efficient way of avoiding manually editing and copying files.

The users' manual suggests copying the client disks to a remote server's network directory and installing from there, as opposed to the usual disk in drive A: situation. Again, it would have been relatively easy for the server install process to copy these files and set up a public directory, similar to CD-Now and CD Net.

Once we started the FILE/RUN/SET UP installation process, LanCD asked for a few parameters that it needed to continue. The usual directory desti-

nation was first, followed by various configuration settings. The first dialog box let us choose IPX, NET-BIOS, or Banyan Vines as our network protocol.

We could also have CD-ROMs mounted as virtual drives, reusing the same drive letter, or we could have them mount as separate drives, which



consumed as many drive letters as we had CD-ROMs to mount.

After completing the network information, the Client Editor screen appeared. We skimmed nine pages in the manual to find out what the various fields were for. We set up the client with the correct information, specifying the default number of concurrent users, to assign a new license in LanCD's license editor.

Then we saved the configuration. LanCD changed some client WINDOWS.INI files, and we had to restart Windows on each client to make those changes final.

■ SciNet CD-Manager 3.01

VERY GOOD

CD-Manager required us to set up our NetServer as a DOS-based NetWare client. Although we didn't cache the local drive using any disk caching utilities, it is important to

note that the CD-ROM drives must be excluded from any disk-caching utility, such as SmartDrv, or the product won't start.

Because CD-Manager is a DOS application, we set up the SHARE on the CD-ROM server just as the manual indicated. Although this method works, SciNet could have used the IPXODI program itself to identify the network number without installing the Virtual Loadable Module or NETX file.

We started the setup itself with the DOS A:\INSTALL command, which brought up the setup screen. We were given a menu to make various choices.

After selecting the new setup option, we were prompted for the serial number of the product. Although we could have run the product for 14 days without the serial number — unlike SciNet Express — CD-Manager included it in the manual and did not require making a phone call to technical support.

The console screen is a simple and easy interface that permits us to change the server name, network numbers, and volume names. It also lets us set the CD-ROM scan interval, which permits the administrator to select how often the CD-ROM drives should be checked during daily use to determine if any of the CD-ROMs have been changed.

Each CD-ROM drive appeared on the setup screen as we proceeded with the installation. Having confirmed that all the drives were present and the setup information was correct, we accepted the configuration and waited for the files to be copied from the setup disk to the hard drive.

No client installation was necessary. We only needed to set up user rights within Syscon.

■ SCSi Express 2.5 for NetWare

SATISFACTORY

SCSi Express was one of two products we tested that required NetWare to be installed before we could install the server software.

After setting up our server with NetWare 4.1, we started to install SCSi Express by typing the simple command LOAD A3N5T40 at the server prompt.

SCSi Express told us we didn't have enough buffers assigned on the Hewlett-Packard Co. NetServer's controller to continue. We were given three options to increase the buffer space. The first was to not use one of the SCSi channels. Because we had the hard drive and CD-ROM tower on separate SCSi channels, we rejected this option. Our remaining choices were to adjust the buffers on one of the SCSi devices manually in STARTUPNCF or to let the SCSi Express install program make the changes. We chose the latter. Having done this, the installation software terminated and returned us to the NetWare console screen. After we rebooted the server, SCSi Express was happy.

There was one other inconvenient prerequisite for smooth operation. An on-screen message told us we needed a software key in order to prevent the software from periodically displaying a reminder to register the product. We called technical support with our serial numbers and got an activation key.

The biggest installation problem occurred when we tried to view the CD-ROM devices through the SCSi Express software. SCSi Express initially did not find the CD-ROM tower or any devices within it. We called Micro Design's technical support, which suggested we unmount all NetWare CD-ROM drivers for the SCSi Express drivers to run correctly. We would have preferred that Micro Design discover the problem for us. Fortunately, the client-side setup was straightforward. In order to successfully set up a client, we needed to map a drive to the path on the server where SCSi Express is installed. Once set up, FILE/RUN/SETUP.EXE copied about 1.8MB of data over to the specified directory on the local machine and set up the program groups and icons.

■ CD-Now 2.10 for NetWare

GOOD

DiscView Pro, the client user interface of CD-Now, took some getting used to. Some of the icons, such as a globe representing the entire network, were unclear. The overall effect was confusion. It would have been better to break up drive mapping and administration into two smaller applications that would not overwhelm users.

On the plus side, accessing CD-ROMs with DiscView Pro to mount and

► *Micro Design International Inc. officials note that you can add a DOS-style menuing interface to SCSi Express 2.5 for NetWare by purchasing McAfee Associates Inc.'s Saber Menu System for DOS; we note that any competitive menuing system would work just as well.*

BEYOND CD-ROM

Both Micro Design International Inc. and Meridian Data Inc. are supporting rewritable optical drives in their respective software packages. Micro Design's SCSi Express 2.5 for NetWare also supports some earlier rewritable optical media, such as write-once read-many discs and mammoth magneto-optical jukeboxes.

Usability

■ CD Net 1.0 for NetWare

GOOD

We found CD Net the easiest product to use, but we could not operate it from the server console, which hurt its score.

When we selected the administrator option to set up the CD-ROMs, the first dialog box that appeared was a visual representation of the CD-ROMs and the CD-ROM server. The unmounted CD-ROMs are grayed out. A button to the right of these with the word

"mount" on it is self-explanatory.

Before we actually mounted a CD-ROM, we had to add the users' rights to the CD-ROM. We did this by clicking the edit button and selecting the user group within the Default Security Group drop-down list. Clicking OK followed by clicking the Mount button set up the CD-ROM for users who had just been given access.

In addition to the auto-mount feature the administrator can also set up a volume with subdirectories in which each subdirectory is an actual CD-

ROM volume. This reduces the possibility of users running out of drive letters for allocation.

Similar to other products that have a Windows interface, CD Net provides an application that allows a user to create a launch icon. When clicked by the user, this launch icon will mount a CD-ROM, if needed, and launch an application either locally from the hard drive or from the CD-ROM drive. When the application is closed, the administrator can choose to have CD Net automatically free up the associated drive letter.

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unmount CD-ROMs was a relatively straightforward task. We were presented with a tidy graphical layout of our network, showing the CD-ROM server, the installed host adapter, and other servers.

Each CD-ROM drive was shown as a

PowerFinder CD-ROMs. After unmounting four CD-ROMs, we switched them with the PhoneDisc CD-ROMs that had been previously mounted. DiscView Pro failed to notice that we had switched CD-ROMs, and did not do an auto-mount. We tried to refresh the drives but had no luck. One of the disks we removed appeared to be still in the drive. Trying to unmount this phantom disk resulted in an error message that the disk was already unmounted, yet we were well aware of this, as the CD-ROM was sitting

on the desk next to the CD-ROM tower. In order for CD-Now to successfully find the replaced disks, we needed to take down the server and bring it back up again.

■ LanCD 3.2

GOOD

LanCD is easy to use, but as with CD Net, we could not manage the CD-ROM server from the console.

The LanCD manager interface is very straightforward and easy to use. Descriptive icons enable an administrator to quickly identify a button with an action. Because most information is in one dialog box, navigating through tasks is efficient.

We also liked LanCD's take on drag-and-drop drive mapping: We could grab the text of a volume name from the dialog box for mounting drives and

drop it onto the desired drive letter. We'd like to use the keyboard instead of the mouse to map drives, however.

Once mapped, the drive letter shows the type of CD-ROM being used, the server name, a unique ID number, and the volume name of the CD-ROM. Unmounting a CD-ROM is as simple as mounting the device. Just highlight the drive letter to be unmounted and click on unmount. Job done.

LanCD is the only product compared that can use a "virtual drive letter" to assign a drive letter to a volume. A drive letter is virtually mapped before running a Windows 3.x application, and can co-exist with a previously mapped drive letter. This feature is not yet available for Windows 95 or the optional Windows NT client. But it's a trade-off anyway, between having constant access to multiple CD-ROMs and conserving drive letters.

LanCD includes two utilities called WMount and WGMount. WMount prevents the CD-ROM from being automatically unmounted at the end of a session. WGMount just assigns a drive letter to the current Windows session. Both functions will allow a user to map a CD-ROM volume to a drive letter, launch an application (on the local drive or on a networked volume), and use information found on the mapped drive letter.

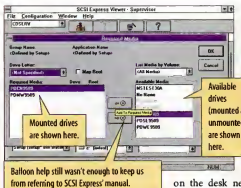
■ SciNet CD-Manager 3.01

SATISFACTORY

CD-Manager does not have a client-side Windows user interface, which hurt its score. But almost everything was on one screen with no complicated terminology or redundant information. The server console displayed the basic information: the server name, the server drive letter, the volume label, and the group name. If you know how to map a drive, give rights to a volume, and create users and user groups, you can manage your CD-ROM server from anywhere on the network.

WAYS TO GET THERE

Your users don't necessarily need to install the client software discussed here. Any product that mounts CD-ROMs as NetWare volumes, which includes all products compared here except LogiCraft Information Systems Inc.'s LanCD 3.2, can allow a user to map drives to CD-ROM volumes using AUTOEXEC, BAT files, DOS MAP commands, Windows File Manager, Novell Inc.'s NetWare Tools, and the Windows 95 Explorer.



Balloon help still wasn't enough to keep us from referring to SCSI Express' manual.

CD-ROM drive icon with the name of the currently loaded disk. If the CD-ROM was not used before, the volume name read New Volume. In order to mount a CD-ROM for the first time, we highlighted the CD-ROM and clicked on the Mount icon in the toolbar. A Volume Configuration dialog box appeared with various options. From here we could automatically mount the CD-ROM each time it was loaded. We could also automatically lock the CD-ROM every time it was mounted. We could also add notes about the CD-ROM, enable Macintosh client support, and enable users to mount and dismount the volume. This is handy if a departmental server has a CD-ROM that is frequently being changed.

Once configuration was complete, we clicked the OK button and returned to the graphical layout. If we elected to lock a CD-ROM after it was mounted, an icon of a padlock was placed next to the CD-ROM icon.

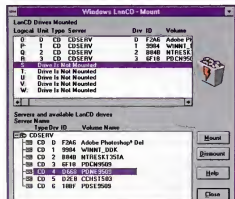
Clicking on the drive mapping icon changes the display to a list of the available CD-ROMs and available drive letters. By clicking on a CD-ROM volume name and dragging it to a drive letter, the drive gets mapped to that volume title. This feature, unique to CD-Now, makes mapping drives very quick and simple.

Like LanCD and CD Net, CD-Now's DiscView Pro lets you create a launch icon that a user can double-click to execute various functions of the CD-ROM server. When we set up one of these SmartLaunch icons, it could log on the user to the CD-ROM server, mount the CD-ROM required, dynamically map a drive letter, and run an application on the CD-ROM. After using the CD-ROM application, SmartLaunch unmounts the CD-ROM, logs off the server, and unmaps the drive, saving both server license costs and server resources.

Although DiscView Pro had its good points, it also became rather stubborn when we replaced the CCH Inc. CCH State Tax Reporter disks with the Directory Assistance Inc. PhoneDisc

TAKING CONTROL

Although SciNet Inc.'s SciNet CD-Manager 3.01 does not let you lock or unlock CD-ROMs remotely, SciNet points out that any remote-control software package could compensate for this shortcoming. The one they recommend is Proxy by Funk Software Inc. Another vendor questioned why someone would want to be able to eject a disk from halfway around the world; the answer is so someone on the other end of a phone line can find it.



This dialog box in LanCD 3.2 contained all the basic functions we needed. We could drag and drop available CD-ROMs onto drive letters. Here, four of seven CD-ROMs are mounted.

Something, however, you can only do from the server console, such as ejecting disks, locking or unlocking disks, and creating volumes where CD-ROMs are subdirectories of one volume name. Another drawback of CD-Manager is

Speed testing

We tested the speed of CD-ROM server software using three tests. The first test had all five clients searching the same CD-ROM simultaneously. The second test had five clients searching on five separate CD-ROMs. Both of these tests employed PhoneDisc PowerFinder, a multithreaded internal White and Yellow Pages application from Digital Directory Assistance Inc. In a third test, five clients searched simultaneously across a four-volume CD-ROM set, CCH Inc.'s CCH State Tax Reporter, which tracks and reports tax information across 50 states.

Performance test configurations



the need to specifically use Syscon to edit user and volume information. This worked fine in a NetWare 2.x or 3.x environment, but as soon as we contemplated using this product in a 4.x network, we had to copy the Syscon files from a 3.12 network and put them into the public directory. Once done, CD-Manager worked fine.

If we changed a CD-ROM and the CD-ROM scan interval was set to 9999, it was necessary to rescans the CD-ROM devices to update the server. On the other hand, CD-Manager was the only product compared that had a function key (F5) always available to refresh the server, instead of having to wait for changed CD-ROMs to auto-mount at the specified interval.

■ SCSI Express 2.5 for NetWare

GOOD

SCSI Express didn't do anything badly, but its SE-View client could have been simplified. Its interface

was informative, but it still required the manuals. Furthermore, the manual needs some work to accurately depict the software. Ideally, we wanted software that was as tidy and useful as the fictional product in the manuals.

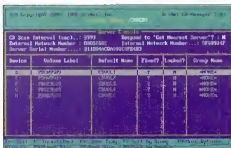
The difference between the server console utility (CDUtlis) and the client-side application (SE-View) was very apparent. If all you want to do is administer your CD-ROM server, then we recommend doing it from the server console. Although not as pleasing to the eye as a nice Windows application, CDUtlis is simple and to the point when it comes to getting the job done.

Once we understood the client software, it was very easy to configure volumes and groups and to implement changes. Although SE-View has a Windows 95-style notebook/tab interface, it would be nice if you could simply use a drop-down menu structure, like CD Net's, to specify what CD-ROM to mount, where the CD-ROM is located, and which users are going to use it.

Instead, you have to flip between various tabs. One of our tasks involved setting up an icon so that we could mount several CD-ROMs as one volume. Our struggle with SE-View's user interface sent us to the manual in order to actually set up the volume.

After successfully setting up this icon, we could see all the CD-ROMs as one volume. Each CD-ROM itself appeared as a subdirectory of that NetWare volume. This helps tremendously in conserving drive letters' allocation from a client workstation. SCSI Express' implementation falls short, however. If you need to change just one CD-ROM and that disk is part of a volume, you must unmount

all the disks within that volume before you can remove one. The same applies to adding, changing, or removing trustee assignments. It therefore be-



CD-Manager's user interface wasn't graphical, but it was simple to use and presented everything on one screen.

comes necessary to ensure that any disks that are changed frequently due to updates, or any disks that may have frequent access privileges altered, are not part of a large volume set. Other products, such as CD Net, don't require this unmounting, but merely "gray out" the icon of the CD-ROM while it is physically removed from the drive.

After creating five new volumes and ejecting the disks from their drives, we swapped the CD-ROMs around and put them back in the drives. We were disappointed to see that when we attempted to remount the media, SE-View showed one CD-ROM as missing and told us that the other four CD-ROMs could not be mounted, without explanation. When we switched the CD-ROMs back to their original locations, we could once again mount the volume successfully. Micro Design acknowledges the problem.

► If you have questions or comments about this comparison, send E-mail to brooks_talley@infoworld.com.

GlobalNet lets 1,024 users share CD-ROMs

Perhaps the most plug-and-play CD-ROM server hardware of all is GlobalNet, a PC-sized device from Optisys Inc., that provides 1,024 users access to a variety of SCSI devices attached to the GlobalNet unit. All we had to do was plug it in to our network and it was ready to go.

Once powered on, GlobalNet broadcast itself to our network as another NetWare server. We told NetWare to attach to GlobalNet and map corresponding drive letters using regular NetWare commands. GlobalNet Route 101 (pictured here) costs \$4,495 and supports hard drives, redundant array of

independent disks, CD-ROM towers, and jukeboxes with as many as 64 platters.

Cost savings over a straight NetWare solution can be considerable, if you factor in Novell Inc.'s NetWare per-user licensing for 1,024 users and the cost of additional memory for those users. If you use a nondedicated file server, Optisys' solution runs its own OS, but abides by the NetWare Core Protocol, which is why other NetWare servers can see it. From NetWare's remote console, you can administer the CD-ROMs using the GlobalNet Console Utility. More expensive GlobalNet models handle a wider range of juke-



boxes. You can reach Optisys on the World Wide Web at <http://www.optisys.com> or by calling (800) 327-1271.

— Scott Mace

► How we tested (from page 69)

Cross-platform support

Because many networks serve a disparate mix of client OSes, we tested each product's cross-platform support on our NetWare network. For cross-platform testing, we used a different mix of clients than we did for our other tests. We used three HP Vectra 66-MHz 486es, each with 8MB RAM and a 3Com EtherLink III NIC. We loaded Windows 95 on one machine, OS/2 Warp Connect 3.0 on the second, and Walnut Creek CD-ROM Inc.'s Official Slackware Linux 3.0 (using kernel 2.1.13) on the third, and we configured them all for network operation. For products that supported Macintosh clients, we used an Apple Computer Inc. Power Mac 7100/66AV as a client. If a product allowed us to map a drive from a Windows 95 client, we assumed it would permit drive mapping from a Windows NT client, because they share common APIs.

We awarded a satisfactory score to CD-ROM server software that ran on or emulated a NetWare 3.x or 4.x

server, allowing DOS, Windows 3.1, and Windows 95 clients to map to CD-ROMs; we also tested the capability to see their resource forks.

We subtracted points from products that could support only DOS and Win-

dows 3.1 clients or that had trouble supporting either of those platforms.

We added points for those products that support Windows NT, OS/2, and Macintosh clients. We also added points for products that included NetBEUI and

Network File System support, or that supported a graphical user interface.

Usability

We looked at two aspects of CD-ROM

Benchmarks

Meridian hardware would have favored Microtest's software more than its own

Our baseline tests assured us that using Microtest Inc.'s hardware did not give the vendor's CD-Now software an advantage. We reran part of our performance test—the five-CD-ROMs-five-clients test—using Meridian Data Inc.'s CD NetROM tower instead of Microtest's CD-ROM tower. Had we used Meridian's hardware for the scored tests instead of Microtest's, CD-Now would have scored even higher than it did.

PhoneDisc PowerFinder, five clients searching a different CD-ROM

Times in hours:minutes:seconds



FROM BOTTOM LEFT: MICROTEST

► David Strom's Web Informant, at <http://www.strom.com>, has information on using the World Wide Web for improving marketing and high-tech product communications. He is a frequent contributor to InfoWorld.



Although we didn't actually go through the process ourselves, we are confident that anyone with extra time can build one of these towers with off-the-shelf parts. Why bother? Because the savings could be substantial — as much as 40 percent over what tower vendors themselves are charging. You can read our article about the cost of CD-ROM towers on InfoWorld Electric by surfing to <http://www.infoworld.com/pageone/tstcenter/cdserver.htm>.

server usability: daily use and administration. The last thing an already harried network administrator needs is a CD-ROM server with client software that will generate help desk calls.

We tested each product's capability to perform routine operations quickly and easily. We mapped drives on each client to CD-ROMs on the server and set up an icon that would automatically map five drives to the five PhoneDisc CD-ROMs. We then checked to ensure that the icon still worked when we re-arranged the order of the CD-ROMs in the tower. Because CD-Manager did not provide any client applications, we mapped the drives using Novell Inc.'s NetWare Tools.

When evaluating the user interface, we considered its administrative capability and the product's ease of use. We awarded a score of satisfactory to products that accomplished tasks we wanted to complete, even if some of the products were difficult to administer.

We added points for products that had an exceptionally easy-to-use interface. We also added points for products that allowed users to continue using CD-ROMs even if the CD-ROMs were moved from one drive to another.

We deducted points from products that had a cumbersome administrative console and from those that made mapping CD-ROM drives a chore for average users. We also deducted points from products that suffered from bugs in their interfaces or that crashed a server or a client.

Security

CD-ROM server software should be at least as secure as the rest of the network, and should allow security to be administered without difficulty.

Each product should be able to lock the CD-ROM drives via software, allowing only authorized users to physically eject CD-ROMs. We tested this by mounting and locking CD-ROMs and then trying to eject them using the CD-ROM drive's eject button. We also tried to eject CD-ROMs from the account of a user purportedly without the rights to do so, using the software's administration program.

We awarded a score of satisfactory to products when administrators could restrict users to different drives and prevent them from ejecting mounted CD-ROMs, either based on the built-in security features of the product or on the product's use of NetWare security. We added points for products with security features that worked without fault, and for products with security features that were exceptionally easy to implement.

We deducted points from products with security gaps that allowed us to map drives without permission. We also deducted points if products did not allow us to administer security using standard network OS tools, or if security was not as flexible as the network operating system.

SUPPORT AND PRICING

Documentation

We scored products based on the completeness and accuracy of the printed and on-line documentation. We awarded a score of satisfactory to products with documentation that could lead a network administrator through basic setup and operations.

We raised the score for products with context-sensitive or other on-line help and tutorials.

Technical support and support policies

We based technical support scores on the quality of service we received during anonymous calls to the vendor and on the availability of knowledgeable technicians. If we had to leave a message, we expected a callback within two working days in order to award a score of satisfactory or higher, or else we awarded an unacceptable score.

We awarded a satisfactory score for unlimited, free phone support. We

added points for support via a toll-free line, fax, CompuServe, the Internet, or a private BBS. A money-back guarantee and longer support hours also raised the score.

Pricing

We scored products based on their list prices for a package for one server and 100 clients. Scores ranged from excellent for prices less than \$800 to unacceptable for prices more than \$2,600.

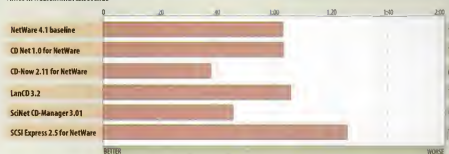
Benchmarks

NetWare 4.1 holds its own with some CD-ROM sharing solutions

Our speed tests showed that CD-ROM server software from five vendors did not always outperform the built-in capabilities of NetWare 4.1. NetWare beat three products in one test using PhoneDisc Powerfinder, a multidisc national White and Yellow Pages application from Digital Directory Assistance Inc., and three products in the second test. The first test had all five clients hitting a single CD-ROM on the server at once; the second test gave each client its own CD-ROM to search. In the third test, a search by five clients across all four CD-ROMs in CCH Inc.'s CCH State Tax Reporter, our NetWare-only baseline fared poorly.

PhoneDisc Powerfinder, five clients searching one CD-ROM

Times in hours:minutes:seconds



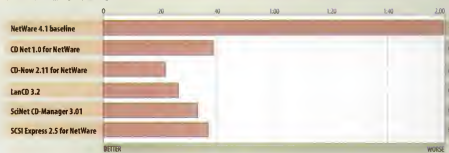
PhoneDisc Powerfinder, five clients, each searching a different CD-ROM

Times in hours:minutes:seconds



CCH State Tax Reporter, five clients searching four CD-ROMs

Times in hours:minutes:seconds



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February 12, 1996
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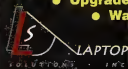
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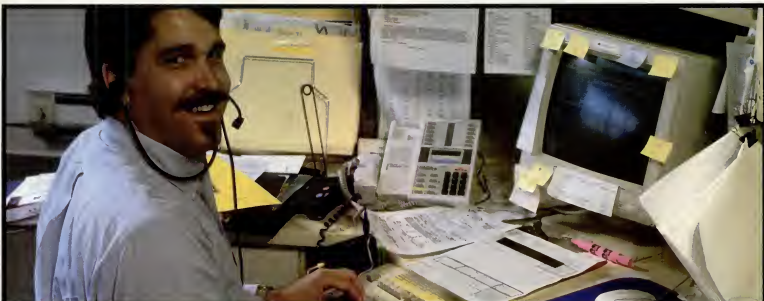
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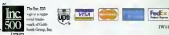
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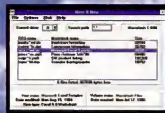


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Upcoming in InfoWorld

FEBRUARY 19 PRODUCT COMPARISON PC X-SERVERS: Client/server may be the phrase of the hour, but certain implementations have been around for quite some time. PC X-servers — historically supporting access to Unix-based mission-critical



OUR PC X-SERVER COMPARISON will cover four solutions.

data and now moving to NT — have long allowed users to logically distribute application-processing and graphics-display tasks between host and workstation. We compare four PC X-servers: Hummingbird Communications Ltd.'s Exceed,

PC-Xware from NCD Software Corp., Walker Richer and Quinn Inc.'s Reflection Suite for 1 and the Santa Cruz Operation Inc.'s SCO Xvision. **ENTERPRISE FEATURE:** It seems as if everyone is touting their product as an "intranet" product, something that will either support or run an internal network based on Internet technologies. We looked at the early adapters to find out the benefits and limitations of today's intranets.

FEBRUARY 26 PRODUCT COMPARISON REMOTE LAN ACCESS SOFTWARE: The remote user population explosion is in full swing, and it's up to corporations to provide their mobile workers and telecommuters with effective and cost-efficient access to the corporate LAN. Now you can turn your remote users into nodes on your LAN without purchasing a whole new server. We tested remote-access software solutions provided by the two network heavyweights, Microsoft Corp. and Novell Inc. We compared Microsoft Windows NT Server 3.51 RAS and Novell NetWare Connect 2.0.

ENTERPRISE FEATURE: Compaq Computer Corp.'s recent internetworking acquisitions have created both hope for one-stop shopping and support and questions about whether the company can successfully integrate internetworking products into its product line. Can Compaq become a one-stop shop for small and medium-size companies? Will the benefits of one-stop shopping convince happy customers of internetworking vendors, such as Bay Networks Inc. and Cisco Systems Inc., to switch? Does Compaq understand internetworking and the needs of corporate network managers?

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PAGE ONE

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► Desktop and server operating system

NT 4.0 looms big on the horizon

By Brooks Talley Despite an apparently marketing-driven version number, Microsoft Corp.'s Windows NT 4.0 is shaping up to be the operating system that Microsoft has promised us for years. The sum of many small improvements, and the lack of

Program Manager, combine to make this a formidable operating system in both its Server and Workstation incarnations.

With the advent of Windows NT 4.0, Microsoft will finally lay to rest Program Manager, perhaps the most hated shell in computing history. Technically adept users hated the glorified menu program, and novices cursed when they accidentally maximized a program group, thereby "losing" all others. Network administrators hated its lack of network awareness, and everyone loathed its fundamentally ugly appearance. Program Manager is dead, and no one will mourn it.

By far the biggest news about NT 4.0 is its new appearance. The Windows 95 shell isn't the pinnacle of modern shell technology — the Start Bar doesn't support drag and drop and icons only partly function as objects. Still, compared to Program Manager, the new shell is a vast improvement.

Windows NT 4.0 goes further than just shedding an oppressive and annoying interface, though. I looked at the first beta of both NT Workstation and NT Server and found new features and refinements that promise to make this the most complete NT yet, for both

users and administrators. NT Server also includes the Internet Information Server and a multiprotocol router.

The most fundamental change to the operating system's architecture involves moving the User and Graphics Device Interface (GDI) subsystems into Ring 0. The User and GDI subsystems are responsible for handling user I/O, including the keyboard, mouse, and screen. The positive side of this development is that there will be some performance improvements for graphics-intensive programs. The negative side is the chance that problems that would once have crashed only the user interface will now crash the entire system.

On a workstation, this isn't a big issue: If your interface dies, you're going to reboot immediately anyway. On a server, however, administrators might usually prefer to wait until after hours to reboot — a choice they will no longer have. It would be nice, though more difficult, to offer a choice of which mode to run User and GDI in.

Another drawback of this change is that it requires rewriting all display drivers for NT. This isn't as bad as it could be, however, because Microsoft supplies the most common drivers with NT 4.0.

In the Test Center, I didn't notice any significant performance improvement over Version 3.51 in either the Server or the Workstation version, and, in fact, both versions were significantly slower to come up. This could well be due, however, to debugging code still in the products.

Performance improvements or no, NT still has a voracious appetite for hardware: Don't even think of running it on less than a 66-MHz 486 with 16MB of RAM. Microsoft is dropping support for 386s with NT 4.0.

Beta 1 of Windows NT 4.0 also includes a true NetWare Directory Services client for NetWare, Internet Explorer 2.0, Telephony API,

and Unimodem support, as well as an Exchange client similar to the one included with Windows 95. Windows NT's Exchange client, however, supports Simple Mail Transfer Protocol.

RISC-based systems will get a 486

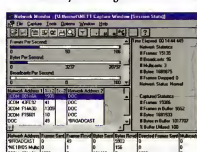
Dynamic Host Configuration Protocol (DHCP), DNS requests won't fail as the machine's IP address changes over time.

Here's how it can work: To connect to a drive named C-ROOT on the machine Spud, for instance,

the Universal Naming Convention would be \\spud.test.net\C-ROOT. The client-side requester determines that spud.test.net is a DNS-style name rather than a NetBIOS machine name, and it queries the DNS for the domain test.net for the IP address of spud.test.net. The DNS, seeing that it has no static entry for Spud, queries

the WINS, which returns the correct IP address to the DNS, which in turn answers the original query. From that point, the NetBIOS requester can directly contact Spud and map the drive.

Because NT relies on the client-side requester to recognize both DNS addresses and NetBIOS machine names, the integration of WINS and DNS allows only NT 4.0 systems, and not NT 3.x systems, to find NetBIOS clients across the Internet.



NT SERVER's new Network Monitor can display network statistics from any active monitor.

emulator in 4.0, as opposed to the 286 emulator in 3.51. Microsoft said this will fix about 30 applications that require 386 enhanced mode to function.

Users who employ a single NT machine in different environments will welcome the addition of Hardware Profiles, which allow a user to set up different configurations of drivers and services and choose among them when booting. This will be especially useful for laptop users who don't want to start a lot of networking services when they're away from the office.

Mobile users will also appreciate the addition of Autodial to the Remote Access Service (RAS) client. This allows a RAS connection to automatically start whenever the system attempts to access a resource that was last used via that RAS connection. For instance, if a recent document in Word's File menu is on a server last reached with RAS, choosing that file will automatically start RAS and connect to the appropriate server.

In addition to the shell, one important new feature of NT Server 4.0 is the integration of Windows Internet Naming Service (WINS) and Domain Name Service (DNS). Now an NT server running Microsoft's improved DNS (it actually monitors) can return the IP addresses of NetBIOS clients. This means that when new machines are added to the network, an administrator no longer has to edit text files on the DNS server to reflect the new machine's name and address. And if that client machine is set up to use

- Progress Provision, Version 8.0 96
- EasyScan, Version 2.6 97
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- Down to the Wire, by Nicholas Pireley 101

THE FINE PRINT

InfoWorld Product Reviews briefly examine beta and recently shipping products. We score only products that are shipping, never those in beta versions. Product Reviews testing follows less thorough criteria than those employed in Product Comparisons.

TALK BACK

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I checked this function in the Test Center and found that the WINS/DNS combination quickly and accurately resolved names for our Windows 95, Windows NT 3.51, and Windows NT 4.0 clients after they logged in to WINS, even after the clients were rebooted and received different IP addresses from DHCP.

► CD-ROM server

Huge CD Tower Rax holds 56 discs

By Andy Nelson

MOST IS MANAGERS would relish the idea of having a seven-CD tower plugged in to the back of their underused SCSI chain, but how about a unit that holds 56 CDs? That's where Procom Technology's Procom CD Tower Rax comes in. Made to be used with Microtest Inc.'s CD-Now software (see product comparison, page 66), this isn't something you would want to try to build yourself. But for IS departments that need its capacity and have \$69,000 to spare, the Tower Rax is an impressive-looking piece of technology. It may cost a lot, but the performance payoffs are worth the money.

Procom sent an engineer to install the Tower Rax, a process that

took almost 3 hours. The first thing we noticed when we powered up the tower was the high-pitched squeal of eight alarms ringing like mad. As the engineer reset each alarm, he told me the commotion was a result of the second (and redundant) power supply being switched off.

Each item within the tower is a hot-swappable unit, from the fans in the processor box to the CD drives themselves. Just as well, really; it would not do to tell your users that 55 drives are going off line because the 56th died and needed replacing.

The brain behind the whole thing is a 100-MHz Pentium-based machine with 128MB of RAM, a floppy drive, a hard drive, and a network card for the environment it

► PROCOM page 101

THE BOTTOM LINE

Microsoft Windows NT, Version 4.0

The Workstation and Server versions of Windows NT are much improved and benefit from the Win95 GUI, yet a change to its core may make the Server less stable.

Pros: Program Manager is dead; Windows Internet Naming Service/Domain Name System integration.

Cons: Potential stability issues for servers; breaks old display drivers.

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► Multiplatform client/server application development

ProVision progresses with SmartObjects

By Alan M. Stoughton

USUALLY, object-oriented programming means negotiating the hazards and complexities of Smalltalk or C++ languages, which makes the road to developing a component-laden application difficult to follow. Progress Software Corp. suggests an easier route with Progress ProVision, Version 8.0, part of its Application Development Environment (ADE), a visual environment featuring SmartObjects: built-in, reusable application components.

Intended for large-scale client/server development, the Progress ADE comes in two packages: Progress ProVision and Enterprise ProVision. Both of these applications provide character-based and GUI capabilities depending on platform and both include the Progress 4GL fourth-generation application development language, User Interface Builder, Report Builder, Appli-

cation Debugger, Results query tool, local database, and client networking.

Separate Progress DataServer products are used with ProVision to access Oracle Corp., Sybase Inc., RMS, C ISAM, Progress 400, DB2, and Open Database Connectivity (ODBC)-compliant databases. The ODBC DataServer is included with the Windows version of ProVision. The ProVision Enterprise edition adds StarBase Corp.'s Roundtable Total Software Management System for controlling large team-development efforts.

ProVision builds on earlier versions of Progress multipatform application development and database software. Developers who are already familiar with the Progress 4GL might feel comfortable moving to ProVision—it's a natural extension of a familiar language into the area of component-based development.

But new users should look at their requirements carefully before choosing Progress ProVision over packages such as Powersoft Corp.'s PowerBuilder, Borland International Inc.'s Delphi, and Microsoft Corp.'s Visual Basic, which offer more component-based, OLE, and ODBC/API features in their latest versions.

The Progress development environment can be used to create applications for deployment across a wide variety of GUI and character-based platforms. If that's your scenario, ProVision deserves a serious look.

I installed ProVision under Windows for Workgroups 3.11 because Version 8.0 can't open or retrieve files with long file names stored in Windows 95 directories. The tilde character (~) used by Windows 95 conflicts with Progress' interpretation of the tilde as a special escape-character delimiter. A soon-



SMARTOBJECTS are added to an application; built-in cue cards and advisors guide the definition of their properties and help in establishing SmartLinks among them.

to-come 32-bit version of ProVision for Windows 95 and Windows NT, due later this year, presumably will resolve this problem.

SmartObject technology is ProVision's focal point. SmartObjects are encapsulated procedures, written in Progress 4GL, that perform six of the most frequently needed database functions. Each Smart-Object knows how to interact with

its peers and uses SmartLinks to connect with them. You can revise an object's underlying code to inhibit defaults or customize its actions. Or you can use ProVision templates to create new Smart-Objects that behave exactly as you tell them.

Building applications with SmartObjects is uncomplicated. I found that the basic collection of six

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THE BOTTOM LINE

Progress ProVision, Version 8.0

Progress ProVision offers easy, fast GUI-based programming under Windows 3.x but deals poorly with Windows 95.

Pros: Built-in, reusable component set covers many database scenarios; applications can be deployed across multiple platforms; full set of supporting tools.

Cons: 16-bit package; has problems with Windows 95 file names; deviates from Windows sizing and minimize/maximize control conventions; lacks GUI robustness found in packages such as PowerBuilder, Visual Basic, and Delphi.

Progress Software Corp., Bedford, Mass.; (800) 477-6473, (617) 280-4000; fax: (617) 280-4095; World Wide Web: <http://www.progress.com>.

Price: \$3,600 each for one to four users; \$3,000 for five to nine users; \$2,600 for 10 or more users. **Enterprise ProVision costs** \$4,400 each for one to four users; \$3,700 for five to nine users; \$3,200 for 10 or more users.

Platforms: Windows 3.x, Windows 95.

covers a wide variety of common database transaction and query operations. There's little question that SmartObjects save design time and effectively illustrate the value of reusable components.

SmartObjects icons appear on a tool palette in the ProVision Interface Builder along with icons for text, field, picture, radio button, check box, push button, frame, list box, combo box, and other familiar GUI form elements. A Visual Basic custom control (VBX) icon includes a set of four VBXes: spinner, timer, combo box, and OLE container.

I created a SmartViewer, to look at names and addresses from a database table, after first selecting its icon and then choosing the table and fields from the dialog options it presented.

Arranging the fields and setting properties was much like using any other GUI form designer. Wizard dialogs stepped me through the making of new SmartQuery and SmartBrowser objects.

Then, after these were also saved, I was able to use them in a SmartWindow to build an application form for selecting, stepping

through, and viewing records.

As each SmartObject was placed in the SmartWindow, Advisor dialogs helped me select and create the appropriate SmartLink between them.

When I finished, I had created a working database transaction form without writing a line of code; SmartObjects and SmartLinks took care of everything. Special customization would have meant delving into the underlying code and learning Progress 4CL, but the form I designed was perfectly adequate for a majority of applications.

Interface Builder is one of six items in the Progress Desktop application toolbox, which also includes a Data Dictionary for database management, a Procedure Editor for code revision, the Results end-user query builder, a Report Builder, and an Application Debugger. ProVision comes with a complete on-screen help system and computer-based training module for getting started.

Alan M. Stoughton is a system design and database consultant. He can be reached on CompuServe at 76676.1050.

QUICK BYTES

Uncomplicated software secures PC hard drives

WINDOWS ENCRYPTION EasySafe, Version 2.6

THE FIRST LAW of computer security is that if a product is too complicated, it won't get used. EliaShim Microcomputers Inc.'s EasySafe is software to protect the data on notebooks without getting too much in the way.

I had no problems with installation from EasySafe's single disk. It took 1 hour and 18 minutes to encrypt every sector of a 771MB hard drive; all went without a hitch. I also had no trouble encrypting a DriveSpace compressed drive. Alas, EasySafe isn't compatible with third-party disk drivers such as OnTrack Computer Systems Inc.'s Disk Manager. One way to check for compatibility is to boot from a floppy and try to read the root directories on the drives you want to encrypt. If

you can see the file names, it is probably safe to encrypt.

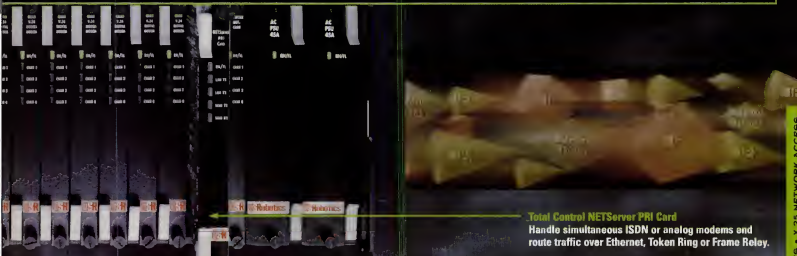
Now, whenever I boot, I have to enter my password. Encryption and decryption is transparent to applications, and the slowdown is barely noticeable. If my password is lost, with proof of identity EliaShim will help me recover access for \$25.

It would be a good idea for EliaShim to improve security by encrypting its password software and adding code to make it difficult to trace the password program. I would also like to see behavior-blocker code to prevent overwriting the area where EasySafe is installed on the hard drive.

■ **EliaShim Microcomputers Inc., Pembroke Pines, Fla.;** (305) 450-9611; fax: (305) 450-9612; World Wide Web: <http://www.eliashim.com>. \$79 for single copy; \$20 each for a 10,000-user site license.

— Earl Greer

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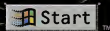


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New Microsoft Word is designed to work hand-in-hand with the 32-bit performance, advanced multitasking, and simplified user interface of the Windows 95 operating system. It integrates seamlessly with the other programs in new Microsoft Office. The combination of new programs and a new operating system makes computing fundamentally faster and easier. Easier for you to focus on your work, not on your software.

Internet antivirus software

McAfee's WebScan safeguards Internet access

By Earl Greer

There is no other antivirus software like WebScan, from McAfee Associates Inc. It's like having a fire wall on your PC. WebScan will scan files downloaded from the Internet and detect infected files before you save them to your disk.

Why not just scan the files after downloading them? Well, as an example, if there's a word processor macro virus embedded in a mail message, then it may have time to do its dirty work before you get around to doing a scan. WebScan places all downloads into a quarantine area and scans them before they are saved. For possibly the first time, a PC-based security product can proactively keep a virus or Trojan horse file from ever getting into the system from the Internet.

To be sure you have a WebScan-compatible E-mail program and World Wide Web browser, McAfee includes licensed third-party products with the package. For E-mail, McAfee contracted with David Harris to license the Windows version of his popular Pegasus mail program. The World Wide Web brows-

THE BOTTOM LINE

WebScan, Version 1.0.1

WebScan is a unique product that scans Internet files for viruses before they are saved to your hard drive. Pros: Reasonably priced, modified version can be downloaded for evaluation. Cons: Documentation on the installation process needs to be expanded; doesn't yet support Microsoft Corp.'s Internet browser.

McAfee Associates Inc., Santa Clara, Calif., (408) 988-3832; fax: (408) 970-9729; BBS: (408) 988-0004; World Wide Web: <http://www.mcafee.com>.

Price: \$65, plus \$50 for two years of updates and technical support.

Platform: Windows 3.1x, Windows 95, Windows NT.

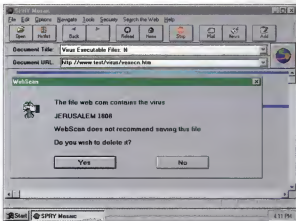
er is CompuServe Inc.'s Spy Mouse.

Because I was running WebScan under Windows 95, I was disappointed that the installer did not read the Registry and automatically configure to my 32-bit Netscape Communications Corp. Navigator.

However, I had no problem manually configuring WebScan as a helper application to this Web browser. McAfee keeps two harmless sample virus files on its Web site, at <http://www.mcafee.com/webscan/demo.alarm.html>. I recommend using these to test WebScan with each of your configured applications.

Problems with both installing and uninstalling are most likely related to the WinSoc support. I read the manual and release notes before installing but still had a serious problem getting the new applications to work. I finally traced it to having two WINSOCK.DLL files in my path. Naturally, the wrong version of the file was first in the path, validating Murphy's Law.

If there is already a WINSOCK.DLL file in your system, WebScan will install its WinSoc Switcher program. This makes it easier to switch between a dial-out WinSoc and a LAN-based WinSoc. The documentation should give a more detailed description of what Switcher does, which is to copy either WINSOCK.LAN or WINSOCK.PPP to WINSOCK.DLL.



WebScan caught this infected file being downloaded with Spy Mouse, even though the virus was in a zipped file.

WebScan has been tested with Netscape Navigator, all versions of Spy Mouse, Netcom On-Line Communications Services Inc.'s NetCruiser, Quarterdeck Corp.'s Qmail, and America Online 2.5 (Windows only); however, WebScan does not yet support Microsoft Corp.'s Internet Explorer browser.

WebScan can be downloaded for evaluation, but for once the McAfee on-line version does not have all the features of the retail version. For example, with the on-line version, Internet access is available only through InterServ (CompuServe).

WebScan does not include McAfee's DOS or Windows anti-virus software, which are separate products. But WebScan does use the same competent virus detection processes as these two products. Do buy the two-year maintenance deal, which includes monthly virus detection updates. Keeping your virus signature files up to date is insurance that the latest virus bug won't bite your data.

Earl Greer is a senior network analyst at a large Texas state agency. His Internet address is egreer@fsztc.fic.dcs.texas.gov.

Unix terminal emulation software

Reflection series customizes your Unix, Digital, HP host connections

By Frank Conley

WORK IN TWO computing worlds: Unix and Windows NT. Supporting four Hewlett-Packard Co. HP 9000 servers running Oracle Corp. databases and 70 users on NT workstations makes for a very dynamic environment. Needless to say, bridging these environments is a key consideration: Performing tasks easily and efficiently between the operating systems is a must.

Getting to the Unix servers from the NT workstations with perfect terminal emulation is the obvious solution, but finding a reliable and stable product has been the challenge. Reflections 1 and 2, from Walker Richer and Quinn Inc., meet my users' needs by providing HP and Digital Equipment Corp. terminal emulation to multiple hosts. They also offer one-step icon selection, which means I can customize and save session settings for multiple hosts for repeated use and then distribute them to users.

There are other products that will emulate both HP and Digital terminals, but none that I've seen offers the degree of customization I need.



AS WITH MANY settings in Reflection, you can customize the keyboard and use it graphically.

My test platform was a 75-MHz Pentium system with 40MB of RAM running Windows NT Workstation 3.51.

The Reflection 2 package — for connecting to Digital's VAXes running VMS or almost any flavor of Unix — contained a CD, a set of

floppy disks, and a number of books. I chose the CD and the typical install option, and the product did the rest itself.

After a reboot, my system came up and I was immediately able to connect to the Unix hosts on my network with VAX terminal (VT) emulation. I then followed this with the installation of Reflection 1 — for connecting to HP 3000 or HP 9000 hosts with NVST (HP's Telnet protocol). This installation was similar to Reflection 2's.

Both products were easy to install.

Users of packages such as NetManage Inc.'s Chameleon were disappointed at what seems like a lack of features, but the focus of this product is terminal connection and data transfer. The Reflections' terminal interface was easy to navigate and not at all intimidating.

I was able to connect to a number of Unix hosts on my network using both HP 232a and VT220 terminal emulation.

I was also able to dial in via modem with no problem, and was able to download files using Kermit, Xmodem, or Zmodem protocols.

The File Transfer Protocol was another plus. It worked well and was as customizable as the rest of the environment, although I would have preferred the arrow keys to appear in the space between the two systems — instead of on the top toolbar.

Once I made connections to my various hosts, I was able to save these, make icons, and add them to the current Reflections program group or distribute them to users. The environment was easily customizable for any number of session types I needed to create.

The ideal Reflection installation is from a network server, where sessions to Unix and VMS hosts can be customized for client access centrally, and then distributed as needed. The package contained a number of system administration tools for customizing and controlling client connections to hosts, security, and on-line help.

Included in the product is Reflection Basic, a Visual Basic-compatible language for creating scripts, a script recorder to shorten script creation time, and a utility for converting Reflection Command Language to Reflection Basic.

The Reflections package is hefty, with a load of very strong documentation. In addition to the Install and Getting Started manuals, there's

THE BOTTOM LINE

Reflection 1 and 2, Version 5.10

Reflection is an ideal tool for system and database administrators who must attach to more than one type of server and who need the convenience of one-stop desktop management with high reliability as well as security and restricted access for users.

Pros: Very customizable; powerful and easy to use.

Cons: Lacks a lot of small extras such as the Ping and telnet utilities and a World Wide Web browser.

Walker Richer and Quinn Inc., Seattle, (800) 872-2828, (206) 217-7100; fax: (206) 217-0293; E-mail: info@wrq.com; World Wide Web: <http://www.wrq.com>. **Price:** Reflection 1: \$399 for single-user license; Reflection 2: \$299 for single-user license; site licenses available for both. **Platform:** Windows 95, Windows NT.

a well-documented manual for Reflection Basic, one for System Administration, and a user's guide.

Frank Conley is a Unix system administrator at Trecom Business Systems, in Atlanta. His Internet address is 72673.615@compuserve.com.

DOWN TO THE WIRE · NICHOLAS PETRELEY

Redmond press machine: What we have here is the ability to communicate

Microsoft SQL Server 6.0 is an excellent database server for those who are content to limit themselves to the Windows NT platform. This can be a problem, because Windows NT has a more uncertain future than ever now that Microsoft is redesigning the kernel in a way that could destabilize the operating system. (See our review of the Windows NT 4.0 beta, page 93.)

Nevertheless, the update to Microsoft SQL Server, Version 6.5, looks to be a great achievement, though one might more accurately credit Sybase for the product, since Sybase was responsible for the core technology.

Now, you'll notice that all the praise I've just given SQL Server is heavily qualified. Words are powerful things, aren't they? If you're careful enough with them, you can communicate just about any message you want, even if the message is meaningless or contradicts the facts. This type of word manipulation is called spin.

There is a season, spin, spin, spin

I'm learning a lot about spin, primarily from Microsoft. No one knows better that perception is more important than reality. Case in point: Microsoft recently visited *InfoWorld* to brief us on the most recent update to SQL Server, Version 6.5. The presentation included a number of graphs.

To learn more about Microsoft's tactics, I find it instructive to observe what these graphs measure. The first graph, a line chart,

plots the momentum in buyer perception of SQL Server 6.0. That's right. Perception—measured, of course, by a Microsoft-sponsored survey.

The bar graph that follows bears the title Strong Customer Confidence and shows how SQL Server has earned more reader's choice awards in trade journals than Oracle or Sybase products. In other words, it's a mind share graph. Perception and mind share pay off. So far, this is a great lesson in marketing, but it doesn't say anything about the product.

The only meaningful information in the presentation was either unflattering or misleading. One slide showed how Microsoft has the best price-performance in the

industry, though the presenter admitted Oracle has since moved into the lead. Another graph demonstrated how much faster Version 6.0 is than Version 4.2, using certain transaction processing tests. Unfortunately, the truth is that SQL Server 6.0 runs slower than Version 4.2 when using real-world transactions instead of those tests (that is, when you use the transaction rollback features of the product). For details, see our review in the Nov. 13, 1995, issue, page 153.

The top of the charts

So what's so surprising about a company being deceptive or pushing its products? Everyone does. IBM recently visited and claimed DB2 (a product that was, not sur-

prisingly, left off all the Microsoft comparison charts) outperforms SQL Server on Windows NT by 2 to 1. No doubt Oracle would make similar claims. We know they can't all be right. That's why we do product comparisons.

What disturbs me is that Microsoft's marketing strategy pivots on convincing customers and the press that Microsoft products are or will be selling better than anything else, rather than on the quality of the products themselves. And when the facts get in the way, Microsoft simply shifts the attention to some other Microsoft product's inevitable success.

Look at Microsoft's reaction to the unenthusiastic corporate response to Windows 95. Add to this unsettling news that OS/2 sales topped 1 million for the month of December, continuing to outsell Windows NT.

In response, Microsoft is suddenly repositioning Windows NT Workstation 4.0 as the inevitable corporate upgrade (once again). Microsoft even released numbers to show corporations are so confident they are buying Windows NT 4.0 sight unseen.

Windows NT is undoubtedly now a more reliable corporate desktop operating system than Windows 95. But don't believe for a moment the hype that widespread migration to Windows NT 4.0 is inevitable. In fact, as unpleasant as the thought may be, I wouldn't be surprised if Windows 95 (and perhaps even OS/2) outsells NT on the corporate desktop for the next couple of years.

For those of you who weren't foolish enough to sign a purchase order for NT 4.0 sight unseen, continue to be very leery about potential stability problems and Network OLE in Windows NT 4.0. Microsoft delayed Windows NT 4.0 primarily to get some version of Network OLE into the product. Why? Because OpenDoc is a serious threat, not

because Network OLE is either needed or ready.

If you want to know how big a threat OpenDoc poses, note that Microsoft has been trying to get its mitts on Athena Design Inc., makers of the Mesa spreadsheet for Next and OS/2. To what purpose? Microsoft already has

Excel, the best-selling spreadsheet on the market.

Microsoft needs more spreadsheet talent on board like it needs another press relations agency.

The problem for Microsoft is that the Athena Design team has great talent and is applying it to OpenDoc components (as if working on an OS/2 product wasn't distasteful enough

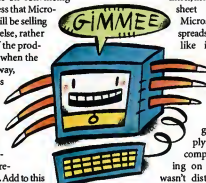
Redmond). Purchasing Athena would put one more nail into the OpenDoc coffin.

I've since heard that Athena may have worked out a deal with DeScribe, which should, at the very least, delay Microsoft intervention. I hope so. Athena has made a bad living by investing in the best technology, because the best technology often does poorly in the marketplace. Now that Mesa is maturing into a highly competitive product, it would be nice to see good technology win.

Here's your chance

So, here's my challenge to Microsoft. If you're going to market SQL Server 6.5, market it on its quality. SQL Server is not perfect, but it's darn good—maybe even the best on Windows NT. You have a golden opportunity to put truth and substance back in your marketing. Give it a shot.

I promise it won't hurt too much. Visit our World Wide Web site at <http://www.infoworld.com>, and send E-mail to me at nicholas_petreley@infoworld.com.



Procom

Continued from page 93

will be used on. With a choice of Ethernet, Fast Ethernet, Token Ring, FDDI, and CDDI (FDDI over copper), this product should have no trouble running on most networks. The processor itself sits between the rack-mounted units about halfway up the tower. If you're willing to drop down to a 42-drive capacity, the Tower Rack is also available with a built-in keyboard and monitor.

The CD drives on the unit I saw were caddy-based six-speed 6.14x drives from Plextor (for \$46,000 you can get the unit equipped with quad-speed drives). Each rack-mounted unit holds seven drives and a Smart SCSI CD module that allows seven CD drives to take up only one SCSI ID. Although in the theory this means that one tower could get by on just two SCSI cards, the



THE TOWER RACK is more than 6 feet high for easy access to hot-swappable components.

equipment. The rear door gives immediate access to the hot-swappable power supplies and fans, in addition to the SCSI chain. The side doors let you slide out one of the rack mounted units.

The whole unit runs using Microtest's CD-Now software on a NetWare server. The software provides various features and applications that enhance the way CDs can be seen and used on a network. Procom is currently finishing its own software for controlling its hardware, and Micro Design International Inc.'s SCSI Express and Meridian Data Inc.'s CD-Net for NT are also certified to control the Tower Rack.

I put the tower through the performance tests used in our CD server software product comparison (see "How we tested," page 69)

using Microtest's CD-Now as the only constant. And what a difference! When running the five-client, five-CD test, the monster machine easily outperformed our seven-CD tower, letting CD-Now finish in nearly half the time.

Much to my surprise, however, the Tower Rack was slower in the remaining two tests (five clients searching a single CD and five clients simultaneously searching a four-volume set)—perhaps due to the 6X drives' higher difference between highest and lowest RPM.

With a total storage capacity of 36 gigabytes, the Tower Rack will cost you about \$2 per megabyte. Hard drive storage space is currently running at about 48 cents per megabyte. But with the Tower Rack, you don't have to copy all of those CDs to a hard drive, and you get hot-swap capability. If a CD drive or a power supply goes down, your server doesn't. And updating information is trivially easy.

THE BOTTOM LINE

Procom CD Tower Rack

The Tower Rack is designed for the corporate user who needs a reliable mass information storage solution with a degree of fault tolerance.

Pros: Allows a large volume of data storage in a rack-mounted unit; most of the tower is hot-swappable for ease of service.

Cons: Initial cost is high; lack of a hot-swap power supply or CPU on the system board could cause problems; external monitor and keyboard.

Procom Technology, Irvine, Calif.: (800) 800-8600, (714) 852-1000; fax: (714) 261-7380; World Wide Web: <http://www.procom.com>.

Price: \$69,000 list price includes 56 six-speed CD drives; Pentium 100-MHz CPU (option available with 133 MHz); 12MB of RAM.

Platform: NetWare 3.x, 4.x, Windows NT.

DISTRIBUTED THINKING • STEWART ALSOP

Notes 4.0 is too complex, and it's got me singing the cross-platform blues

I REALLY SHOULDN'T be writing about Lotus Notes, Release 4.0. It's not fair. I'm a Macintosh user, after all, and Notes wasn't designed for the Mac; the current version of Release 4.0 for the Mac is still a beta version. We don't have any Notes 4.0 servers installed in our production system yet, so I haven't seen it working with real information. And both our Celebrity Nerd, Nick Petreley, and our IS Guru, Brian Comans, are favorably impressed with the new version of Notes.

I guess I shouldn't be writing about Notes because I don't share the enthusiasm that I see displayed for the software in nearly every comment I read or hear. By not sharing that enthusiasm, I appear to be out of the mainstream. But, heck, what's new?

Part of the reason I've always had difficulty with Notes is precisely that it is so hard to write about or be knowledgeable about.

First, you have to live in an organization of at least 100 people or so to really be able to use it. (This eliminates free-lance writers, industry analysts, and most consultants and researchers.) That's because what Notes is designed to do isn't done—at least formally—in small organizations. Notes requires at least one individual with expertise in designing applications and maintaining the software

for the smallest functional system. (We lost our expert to a sister company a few months ago, but I hear we have finally located a good candidate to replace him.)

Second, the organization you live in has to be fairly well organized. That's because the value of Notes is directly related to how well you can organize the system for distributing information and integrating it into your existing systems. If you can't do that, then your users learn there's no real value in the Notes databases and stop looking at them or contributing to them, which was the point in the first place.

Third, Notes isn't easy to use. Because it is designed as a generic environment for distributing information around an organization, the user interface itself must be generic enough that it can be applied to any application. This means the most important part of the user interface, the part that communicates the functionality of a particular application, is left to the application developer, who is the

person least likely to understand the theory and function of user-interface design. Notes application developers just don't like to be told how to design their applications, particularly by users.

I do work in an organization of more than 200 people, we are pretty well organized (in comparison to most publishing companies), and we do use Notes extensively. But we don't use it very well.

I'm using a prelease version of Notes, Release 4.0, on a Macintosh on a network, don't forget, without any Notes 4.0 servers installed.

I know 4.0 is going to be a major boon to organizations that already have Release 3.x of Notes. It is better than the old version for a variety of reasons, mostly related to managing replication between servers and to maintaining and designing applications on Release 4.0 servers. I also know that, once the systems group does install a Release 4.0 server, I will suddenly get things—agents, for instance, and better E-mail—that I don't have right now. But right now, what I have is a really marginal Macintosh program that runs more slowly and takes up more memory than the previous version.

Lotus can easily say that the Macintosh is behind in functionality. It is. One of the reasons Notes requires so much memory is that the memory management on the Mac is so crazy. Another reason is that Notes depends heavily on OLE, which is not officially supported in the MacOS and must be loaded separately. The combination of Notes and OLE

occupy 11MB of my 24MB of RAM. That means I can't get Notes, Microsoft Word, and Netscape Navigator open at the same time.

Lotus says Notes is cross-platform, so I certainly don't appreciate the fact that Lotus promises to put Notes on the Macintosh and then says it won't take the time to make it work properly on that platform. That's not cross-platform.

And I do use Netscape Navigator on the Macintosh, which is another cross-platform application. In fact, Netscape wasn't able to deliver its Java interpreter in the current version of its Macintosh browser, so it did with its Windows 95 and Unix versions. So Lotus is not unique in having problems supporting the Macintosh. But the Macintosh Navigator still feels like a Macintosh program, and Netscape has gone to the trouble of actually supporting Macintosh-specific features, rather than just cross-compiling.

In fact, I'm tempted to keep up the comparison. Lotus took three years to deliver a new version of Notes; Netscape took nine months. Notes is a big and complex product that requires you to work in an organization that is organized. Navigator is a fairly simple product that lets you share information either as an individual or a member of a group in a completely disorganized way. Every major extension of Notes' functionality depends on Lotus' capability to design and deliver it; Navigator is just one of a crowd of browsers in an environment of open standards that any developer can use and support.

I say, I know I'm out of the mainstream. But I am still struggling to understand why IBM thought this product was worth \$3.5 billion.

Write to Stewart Alsop at stewart_alsop@infoworld.com.



NOTES FROM THE FIELD • ROBERT X. CRINGELY

Change is inevitable — but will Apple recognize itself when it's all over?

AN NOW WE STAY in this position for an hour," Pammy said.

The order, though peremptory, was the most welcome in Pammy's week-long battle to boost our fertility.

She's got me swilling Siberian ginseng. We're reading Mia Farrow's autobiography, *Eight is Not Enough*. We've sat clutching crystals, lugubriously chanting. Last night, we headed out into the country to harvest mandrake root naked under the moon. A crowd of adolescent cowhands parked their pickups and watched Pammy's slim, blond form dancing in the shadows of the field. A few even raced home for their video cameras.

I'm of two minds about all this. There are multiple instances of me on the same platform. I'm like Captain Haddock on those old Tintin cartoons: A tiny Cringely with angelic

wings is sitting on my doubting shoulders remonstrating with a fendishly horned and tailed bad Bob.

The good Bobby wants to give Pammy what she wants. His evil twin wants things to stay the way they are.

The way of all flesh

This is the human condition, of course. The beneficiary of any system wants the institutions of his good fortune to never change.

Apple, for instance, resisted change so fiercely it never noticed that things had changed forever. Now Gil Amelio has been hired to make Apple profitable even if the new Apple is half the size of the old company.

My friends at Apple are certain that whole divisions are ready for Gil's hatchet: Newton may really be sold to Oracle after all, Apple

may abandon the low-end consumer market, and all sorts of Windows-challenging technology—including a rack-mounted, fault-tolerant Internet server with mirrored 150-MHz 604 PowerPC processors and redundant memory, storage, and power supplies—will never see the light of day.

Incidentally, to everyone who writes asking for a picture of Pammy: Even though she's going through a lot of changes, the dear girl is surprisingly camera shy.

The good old days

"How long do I have to stay like this?" I asked, my hips steeped beneath me by four or five firm pillows.

"Just lie back and enjoy it, Bobby," Pammy said firmly. "If this works, in seven months you'll look back to these days with longing."

If you are an Excel 7.0 user, you're probably yearning for the days of Excel 6.0. If you misspell a word in the new version of Excel several times and then use the spell check to replace all instances of the word with its proper spelling, it will only correct the word the first time. Every other instance in the spreadsheet

will appear in truncated, abbreviated form.

CompuServe users feel pinched, too.

CompuServe recently mailed out WinCim 2.0, and it works just fine on Windows 95. If you install it on Windows 3.11, however, you can't switch to the Internet with the WinSock enabled. The only fix appears to

be to return to WinCim 1.4 or upgrade to Win95. WinCim users are not happy.

I WAS FEELING fairly rebellious when Pammy finally let me up.

As I pulled on a pair of itchy but very loose, coarse cotton underpants Pammy had ordered from Sri Lanka, the bad Bobby was ascendant.

"Right, what's next?" I asked, anticipating a lengthy visit to some mummus-clad quack who would channel a particularly fecund ancient Egyptian couple.

"Drastic action, Bobby, drastic action," Pammy answered.

What's she talking about? Call me at (415) 312-5555; fax: (415) 286-2775; or cringe@infoworld.com.



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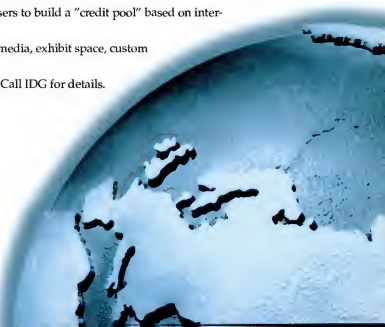
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Advertising in the One-to-One Future

Don Peppers and Martha Rogers are co-authors of *The One to One Future: Building Relationships One Customer at a Time*. They can be reached at:
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There is just too much advertising out there for any of it to be effective. Too many advertisers are chasing too little consumer attention span. And too many channel choices are available to any viewer who doesn't want to waste 30 seconds on a commercial 99.9% likely to be totally irrelevant to his own individual needs. Mass media is melting down, and this is causing a lot of marketers to question the doctrines of the old-time religion.

Fortunately, just as mass marketing is beginning to collapse under its own weight, computer technology is making a new kind of business competition possible—a competition based, not on market share, but on share of customer, measured one customer at a time. Companies now have the computational power to remember every detail of a customer's transaction history. Manufacturers and service providers are bringing to market an increasing assortment of highly customized goods and services—mass-customized products, individually tailored to meet individual needs, one customer at a time.

And, while it is information technology that makes 1:1 marketing possible, it is the rapidly declining effectiveness of mass media, coupled with the rise of addressable, interactive media—1:1 media—that makes 1:1 marketing necessary for any competitor to survive and prosper in the Interactive Age.

Focusing on share of customer rather than market share makes for a dramatic change in the rules of engagement governing business competition. Success in this new environment will require:

- Developing long-term relationships with individual customers, in order to increase individual customer lifetime values;
- Differentiating customers, in order (1) to understand different customers' different needs from your firm, and (2) to allocate the most effort and resources to those customers who are the most valuable to your firm;
- Collaborating with customers, individually, either by having them specify how they want their own, individual products or services delivered, or by getting them operationally entangled in the selling process itself;
- Producing a high-quality product and service, because share-of-customer strategies are based on repeat purchases and customer referrals; and

- Initiating, maintaining, and improving dialogues with individual consumers, supplementing and sometimes abandoning the old-fashioned advertising monologues of mass media.

So if these are the new rules, what kind of "advertising" will characterize the one-to-one, interactive future? For starters, it's likely that interactivity will mean the end of those obnoxious television spots that seem designed to irritate viewers into remembering the products. "Ring around the collar" and "Aetna I'm glad I met ya" are doomed. And good riddance.

In the 1:1 future, three forms of advertising will dominate interactive media:

- **Invitational advertising:** This is what most "ads" will look like that come at you through your interactive television set without your advance approval or request. Successful advertisers will have to stop their frenetic shouting at customers, and will instead offer polite invitations, designed to initiate or continue individual customer dialogues. Starting a dialogue will be the primary goal of any marketer hoping eventually to sell products or services. Whether it's Toyota promoting its Web Site or AT&T promoting its small-business on-line network, mass media will increasingly find itself used to drive customers into more effective dialogue mechanisms.
- **Solicited advertising:** There will be a booming market for advertising-on-demand. Consumers will "look up" advertising whenever they wish to begin thinking about buying something, or when they want to compare prices, features or services. We have two principal forms of solicited advertising today, both in print—classified ads and Yellow Pages, the two largest and fastest

growing advertising vehicles. Electronic, interactive versions of these media will represent a very significant form of advertising in the 1:1 future. The World Wide Web itself is basically one giant, electronic directory of solicited advertising.

- **Integral advertising:** As customers opt out of advertising per se, advertisers will, more and more, include brand messages as integral parts of entertainment and information programs. Already product placement in movies is big business, with clear distinctions in placement fees for background use vs. handling by the hero. In the future, we will see a greater fusion of publicity, advertising, and careful product placement in nearly every media outlet. See the movie, then buy the t-shirt at Blockbuster, get a set of the characters at McDonald's, converse with the stars at <http://www.toyota.com>. Consumer marketers eager to make as broad an impression as possible will gravitate to movies and public events that command a mass audience—something that is likely to get harder and harder to find.

Does this mean traditional mass media advertising will disappear? No. But such advertising will play a smaller and smaller role in the marketing plans of any company. Media fragmentation will continue to make mass messages more and more difficult to deliver.

One rule for mass media advertising will be putting messages out to people with whom no dialogue is ever contemplated. Believe it or not, a wide variety of "badge" products, from athletic shoes and beer to automobiles and fashion accessories, are pitched to people who are not now, and never will be, customers. This is not a mistake. After all, it's no fun to pay \$200 for a pair of shoes, or \$40,000 for a car, if your friends haven't heard of the brand.

Some say the mass marketing game is changing. They're wrong. That game is over, and the rules for an entirely new game are only just now being written. One of those rules—how advertising messages will be used, not just by marketers but by consumers—remains to be fully fleshed out. But one thing is certain: In the 1:1 future, the consumer will be the one in the driver's seat, and the advertiser will be thumbing a ride.

Do you have examples of invitational, solicited, or integral advertising?

We welcome your thoughts. The first 25 respondents will receive a free copy of Don Peppers' and Martha Rogers' book, *The One-to-One Future: Building Relationships One Customer at a Time*. Please send your responses to deanne_hoppe@infoworld.com or fax to (415) 638-2422.



INFO WORLD

February 19, 1996

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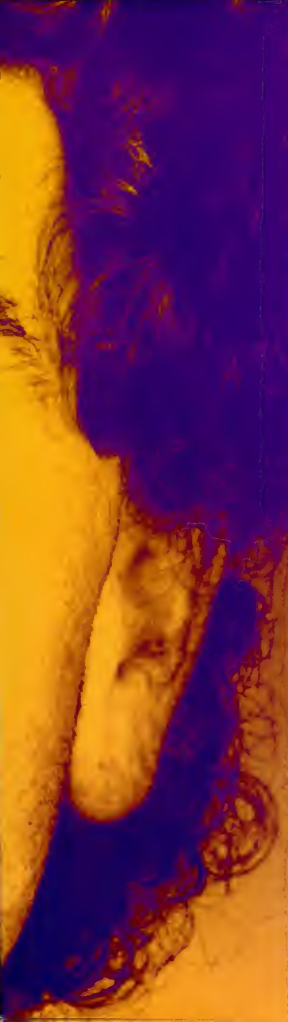
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